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Paper TRADE JOURNAL

REG. U. S. PAT. OFF.

VOLUME 125, No. 12 SEPTEMBER 18, 1947

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ASTEN-HILL MFG. CO., PHILADELPHIA • ASTEN-HILL LTD., VALLEYFIELD, QUE.

FOUR "DOUBLE" SUCTION PRESSES IN NEW* INSULATING BOARD MACHINE

*SINCE V-J DAY

Cantilever Type Machine . . . Designed . . . Built . . . Installed . . . and Operating . . . all since V-J Day. This is the "First" Insulating Wall Board Machine ever built in which "all the pressing" is done by suction rolls operating in pairs. Note that Downingtown Suction Rolls are used for both TOP and BOTTOM Press and that no plain press rolls are used. . . . Ask us about other paper and board machines we have recently built, and are building. Downingtown Mfg. Co., Downingtown, Pa.

DOWNINGTOWN

Designers & Builders
Paper Making Machinery

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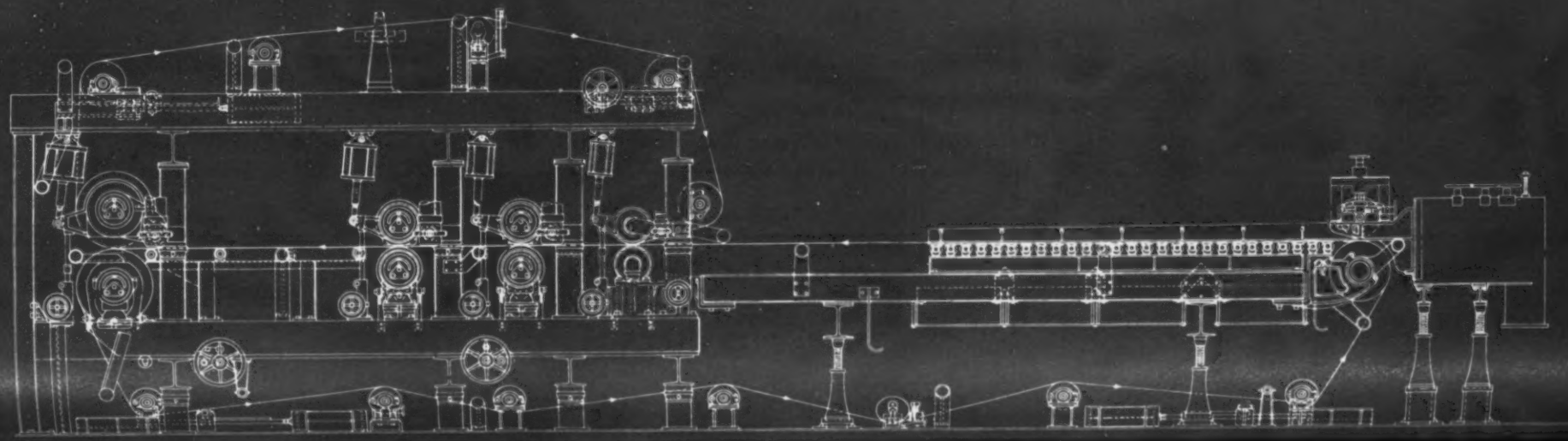

IN THIS ISSUE

SEPTEMBER 18, 1947

Marathon Moves Into New Carton Plant	7	Harris-Seybold Co. Increases Shipments	22
Congress Receives Bids For Fourth Quarter Paper Supply	7	Lukens Group Plays Host To Visitors	24
Newsprint Output Up to New August Mark	8	Little Adds Nine To Research Staff	24
Bowater To Expand Newsprint Output	8	Oakite Stages Series Of Technical Meets	24
British Shipments Off 22.6 Per Cent	8	Kalamazoo Mill Men Start Fall Program	32
Kieffer Advances Edna S. Robertson	14	IMPORTS	36
Mando Names Faegre To Paper Division	14	TRENDS	38
Kimberly-Clark Sets Up Quarter Century Club	16	PRICES	39
Hammermill Adds 39 To 20-Year Club	16	MARKETS	40
Gilbert Entertains 80 At Anniversary	16	PRODUCTION RATIO REPORT	46
Westvaco Again Wins Trophy For Report	18	EDITORIAL	47
Brotherhood To Seek Taft-Hartley Repeal	18	CLASSIFIED ADVERTISING	62
FINANCE	20	**Technical Section ("TAPPI")**	
NEPCO Grants Cash To Home-Builders	22	Nonfibrous Raw Materials Report—1946	49
		The Decomposition of Methylated Sprucewood	55

INDEX TO ADVERTISERS ON PAGE 78

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CALENDAR OF COMING EVENTS

September 25-26, 1947—TAPPI Plastics Meeting, New State College of Forestry, Syracuse, N. Y.

October 4-6, 1947—National Association of Waste Material Dealers, Inc. Fall Convention, Hotel Ritz-Carlton, Atlantic City, N. J.

October 9-11, 1947—TAPPI Alkaline Pulping and Chemical Products Meeting, Asheville, N. C.

October 23-24, 1947—TAPPI Fibrous Agricultural Residues Meeting, Alton, Ill.

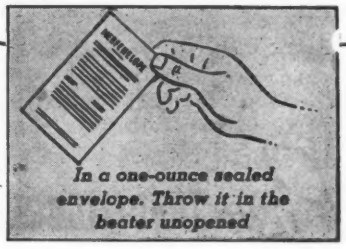
October 27-29, 1947—The National Paper Trade Association of the U. S., Inc., Semi-annual Convention. Hotel Sherman, Chicago.

November 3-5, 1947—TAPPI Second Engineering Conference, Philadelphia, Pa.

May 18-20, 1948—American Pulp and Paper Mill Superintendents Association, Annual Meeting, Roosevelt Hotel, New Orleans, La.

Merfenelopes

FOR SLIME CONTROL



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Cleans Pipes
Kills Bacteria
Reduces Washups
Fewer Slime Rejects

R. T. VANDERBILT CO., INC.

230 Park Avenue, New York City

Paper TRADE JOURNAL

VOL. 125, NO. 12 REG. U.S. PAT. OFF. SEPTEMBER 18, 1947

Marathon Moves Into New Carton Plant

MENASHA, Wis. — A new plant to house the expanded carton and folding box manufacturing operations of Marathon Corporation, manufacturers of packages and packaging materials for food, is now being occupied and will be in full production by October 1. The one-story building, which contains a total of 304,000 square feet of floor space, is constructed of reinforced concrete with brick and concrete exterior in a U-shaped layout. Many advanced engineering and production ideas are incorporated in the construction, layout, floor plan and planned arrangement of operating equipment in the new plant. An interesting and unique feature of the new installation is an unusual system of dust control to insure the highest possible degree of cleanliness in the manufacture of Marathon food packages.

The new building, after October 1, will house all carton production units, carton raw material storage, warehousing for finished cartons, a die room, roller coating department, maintenance machine shop and a parts crib. Raw material storage, the location of production units and the storage of finished cartons are so arranged that the most modern principles of material handling govern the flow of materials through the plant.

In addition to the manufacturing and warehousing units, various plant administrative offices and nine operating departments will also be housed in the new building. These departments in-

(Continued on page 44)

Congress Receives Bids for Fourth Quarter Paper Supply

Coosa River Contract Goes to Sirrine Firm

BIRMINGHAM, Ala. — Signing of an engineering contract for the $30 million newsprint mill to be built at Childersburg, Ala., was reported last week by the Coosa River Newsprint Company. Contract for construction went to the J. E. Sirrine Company, of Greenville, S. C., which had done much of the preliminary work on the mill. Negotiations were handled for the owners by Kimberly-Clark Corporation, which will manage the mill.

As previously reported in PAPER TRADE JOURNAL, the new plant, located 40 miles from Birmingham, will have an annual capacity of more than 100,000 tons of newsprint, plus more than 50,000 tons of bleached sulphite.

Ketchikan Pulpwood Tract Is Offered for Sale

WASHINGTON — The Forest Service of the Department of Agriculture has placed on sale the second large tract of Alaskan pulp timber, amounting to 1,500,000,000 cubic feet.

The sale will be linked to probable requirements for 5 or 6 large pulp mills in the area, it was said, similar to the contingent requirement for mills in connection with the first offering.

The second tract is in the general vicinity of Ketchikan.

WASHINGTON — Bids were received on Monday by the Joint Congressional Committee on Printing for paper for the use of the Government Printing Office for a three months period beginning October 1. Awards are to be made next week. The bids were as follows:

Newsprint

No. 1—800,000 lbs., 24x36—64; rolls, 19, 24, 36, and 48 ins. wide (3-inch fiber cores).

Machine-Finish Book

No. 3—300,000 lbs., 25x38—70; flat, cut any size, min. 21 ins., max. 48 ins.
Barton, Duer & Koch Paper Co. (300,000 lbs. total, Lots 3, 4 & 5) ..... .1173c

No. 4—500,000 lbs., 25x38—70; flat, cut 24x38, 28x48 ins.
Barton, Duer & Koch Paper Co. (300,000 lbs. total, Lots 3, 4 & 5) ..... .1173c

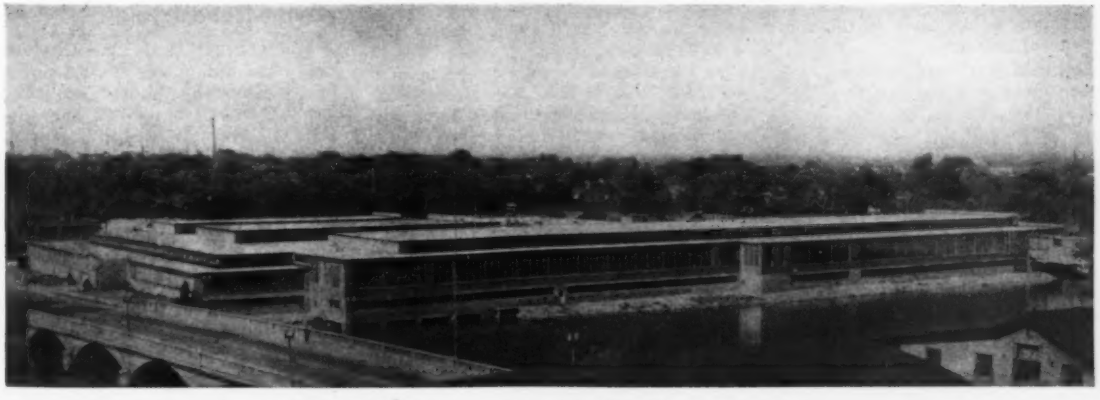
No. 5—500,000 lbs., 25x38—70; flat, cut 24x38, and 38x48 ins.
Barton, Duer & Koch Paper Co. (300,000 lbs. total, Lots 3, 4 & 5) ..... .1173c

No. 6—100,000 lbs., 25x38—70; rolls, 28½ ins. wide, (3-inch fiber cores).
Barton, Duer & Koch Paper Co. (300,000 lbs. total, Lots 6, 7 & 8) ..... .1085c
Mead Sales Co. ..... .1072c

No. 7—175,000 lbs., 25x38—70; rolls, 19 and 38 ins. wide (3-inch fiber cores).
Paper Corp of U. S. ..... .1178c
Barton, Duer & Koch Paper Co. (300,000 lbs. total, Lots 6, 7 & 8) ..... .1085c
Mead Sales Co. ..... .1072c

No. 8—175,000 lbs., 25x38—70; rolls, 19 and 38 ins. wide (3-inch fiber cores).
Paper Corp of U. S. ..... .1178c
Barton, Duer & Koch Paper Co. (300,000 lbs. total, Lots 6, 7 & 8) ..... .1085c
Mead Sales Co. ..... .1072c

(Continued on page 26)



Marathon's new carton factory makes ready for operation

Newsprint Output Up To New August Mark

NEW YORK — Newsprint production in Canada during August 1947 amounted to 377,941 tons and shipments of 388,106 tons, according to the News Print Service Bureau. Production in the United States was 70,507 tons and shipments were 69,326 tons. The output in Newfoundland was 31,873 tons and shipments were 30,136 tons making a total North American production of 480,321 tons and shipments of 487,568 tons, compared with continental production of 468,236 tons and shipments of 461,015 tons in August 1946. North American production in August 1947 was greater than in any previous August on record.

The Canadian mills produced 220,400 tons more in the first eight months of 1947 than in the first eight months of 1946, which was an increase of 8.1 percent. The output in the United States was 34,424 tons or 6.7 percent more than in the first eight months of 1946; in Newfoundland production was 2,939 tons or 1.2 percent more, making a total increase of 257,763 tons, or 7.4 percent more than in the first eight months of 1946, and also was higher than in any preceding similar period.

Stocks of news print paper at the end of August were 80,932 tons at Canadian mills, 1 ,833 tons at United States mills, and 63,811 tons at Newfoundland mills, making a combined total of 156,576 tons compared with 163,823 tons on July 31, 1947, and 206,511 tons at the end of August 1946.

Worthington Denies Intent To Curtail at Holyoke

HOLYOKE, Mass.—Persistent rumors that a considerable lay-off is impending at the Holyoke plant of the Worthington Pump and Machinery Corp. have been denied by Production Manager Leslie Rickett at the Harrison (N.J.) plant, headquarters of the company. He also denied an additional report that the company was again considering closing down the Holyoke works. The absence from the city of Holyoke Works Manager Herman J. Shorle led to the inquiry being made to the company general offices.

Rickett said that there had been some reduction in the manufacturing personnel at Holyoke as the "inventory was out of hand," but that there had been no planning to close down the local works as had been done for a number of years, prior to the last war. Principal output of the Holyoke plant has been deep-well pumps, air compressors and some refrigerating machinery since the reconversion from large wartime contracts.

No information as to the extent of the reduction in employees at the Holyoke plant was available either from Harrison or from the Holyoke offices.

Brown Sells Bersimis Tract to Anglo-American and Donnacona

BERLIN, N. H.—F. G. Coburn, president of Brown Corporation, Canadian pulp producing subsidiary of Brown Company, this week made public the sale of the corporation's Bersimis timber interests in the Province of Quebec. The timberlands, which are not advantageously located as a source of pulpwood to Brown's Canadian mill at La Tuque, have been sold to Anglo-Canadian Pulp and Paper Mills, Ltd. and Donnacona Paper Co. Ltd. Proceeds of the sale will make possible the completion of certain important steps in Brown's plant improvement program.

Bowater to Expand Newsprint Output

CORNERBROOKE, N. F.—Sir Eric Bowater, president of Bowater's Pulp and Paper Mills, has announced that a groundwood machine with a productive capacity of 100 tons daily will be installed in the Cornerbrooke pulp and paper mill.

Sir Eric did not elaborate on the announcement, but local observers said the new machine would give expansion and machine installation. Permanent employes would also be required to operate the new machine, which will handle 30,000 cords of pulpwood annually.

The wood will be taken from the annual export quota, giving still more employment in its transportation to the mill. The machine is expected to be in operation by the early summer of 1949.

Following up this announcement, Sir Eric said he looked forward to a more balanced economy in Newfoundland and added that he thought the diversification of industry was almost essential.

Carriers Seek Rise In All Commodities

WASHINGTON — An immediate temporary 10 percent increase in freight rates on all freight except coal, coke and iron ore, has been asked by the railroads in a petition before the Interstate Commerce Commission. The Commission is considering the road's plea for an over-all average permanent increase in rates of approximately 27 percent. Separate increases are asked for coke, coal and iron ore.

The temporary increase is sought, road counsel explained, to offset recent wage increases, and other increases in costs of materials and supplies that have occurred since the original petition was filed. The temporary increase, if granted, would remain in effect until the I.C.C. acted on the request for an over-all increase.

The temporary increase would call for an added 10 cents per net ton on coke, 11 cents on coal and 10 cents on iron ore.

British Shipments Off 22.6 Per Cent

MONTREAL, Que. — Shipments of newsprint from Canada to the United Kingdom in June totaled 17,089 short tons—approximately 50 percent of the total of 34,068 tons exported there in the first six months of 1947. Exports to United Kingdom to the end of June were 22.6 percent below the comparable 1946 figure. This is shown by figures just made available by Newsprint Association of Canada. They are compiled from reports of Dominion Bureau of Statistics.

Despite the cutback of 50,000 tons of newsprint by the United Kingdom for the latter half of 1947 these figures would indicate that exports to the United Kingdom in the latter half of 1947 would be nearly double those of the first half of U.K. is to take 100,000 tons newsprint in 1947 (contract for 1947 was reported at 150,000 tons before cutback).

Total overseas newsprint exports in June were up 31.7 percent while shipments to the United States were up 11.8 percent. For the six months, overseas exports were up 4.8 percent and shipments to the United States 14.5 percent.

Shipments to Australia were the largest overseas in the first half with 75,145 tons shipped. This is 36.4 percent over the comparable 1946 figure and more than double the amount shipped to the United Kingdom.

The British Newsprint Supply Company, which under government orders had to postpone delivery from Canada and Newfoundland of newsprint expected during the last half of 1947, will be able to take part of the consignment due under existing contracts in the first half of 1948, Sir Stafford Cripps, president of the British Board of Trade, told the company last week.

Contracts made between the company and the Canadian and Newfoundland mills provide for a total import of 180,000 tons in 1948. Of this, Sir Stafford said, 50,000 tons of lightweight newsprint would be taken.

Walloomsac Buys Mill Site From Mechanicville

MECHANICVILLE, N. Y.—City authorities have announced the sale of about fifteen acres of land here, including the former power house of the Hudson Valley Railway Company, as the site for a proposed paper mill. The property was owned by Anson B. Collins and the deed shows that it is disposed of to the Walloomsac Paper Company. The latter also operated a paper manufacturing plant at Walloomsac. The property involved in the sale has a frontage of 1,800 feet on the Hudson River, including docks on the Barge Canal as well as the rail facilities of the Delaware & Hudson. It is expected that paper boxes will be manufactured by the new owners after reconversion.

EVERY PAPERMAKING ROLL* IN YOUR MILL NEEDS TO BE KEPT CLEAN, SMOOTH AND SHINING WITH A *VICKERY DOCTOR* ENGINEERED FOR THAT PARTICULAR ROLL

***On Wire Rolls**—Vickery Doctors increase wire life, eliminate ridging, often eliminate one or more showers.

***On Press Rolls**—Vickery Doctors improve paper uniformity and reduce pick-ups and breaks. They are water-tight.

***On Dryers**—Vickery Doctors improve paper finish and reduce steam consumption by keeping the surfaces free of fuzz and scale.

***On Calender Rolls**—Vickery Doctors operate continuously to keep the paper always free of calender marks and minimize roll maintenance.

***On Super-Calender Rolls**—Vickery Doctors keep both steel and fibre rolls continuously clean with minimum sanding and refinishing. More uniform paper finish, higher speed operation and fewer breaks result.

BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

The most important advance in motor design in 58 YEARS...

Features and improvements demanded most by users

When Westinghouse engineers began designing a postwar motor they abandoned the concept that all motors must be cousins. Instead, they asked electric motor users *what they wanted* in motors . . . features they couldn't buy in any one motor.

These features demanded most by motor users are *all* incorporated in the new Life-Line Motors:

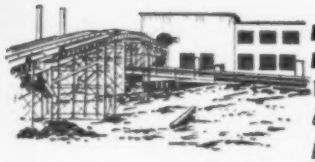
ALL-STEEL PROTECTION. All frames, feet and brackets are HEAVY STEEL. Life-Line Motor stators are far stronger—a new core locking device eliminates rivets.

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

uses 4 logs instead of 5

another 20% log saving at Weyerhaeuser



***NEW WEYERHAEUSER PLANT** at Longview, Wash., from which debarked logs go to both pulpmill and saw mill.*

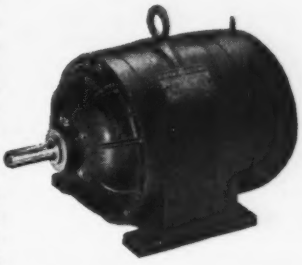
Five years ago, the Weyerhaeuser Timber Company installed a General Electric motor to drive a chipper in its first whole-log pulping plant. The shocks and stresses imposed by the powerful chipper were extraordinarily severe. Yet, year after year, the General Electric motor stood up under those strains. Today, it's still on the job, feeling just as young as ever.

In fact, so convincing was the performance of this motor that Weyerhaeuser management decided to "make it the same" when ordering electric drives for its second whole-log pulping plant. Only this time it was "G.E." all the way—a General Electric induction motor was selected to drive the barker pump, and a General Electric synchronous motor was specified for the chipper drive.

Today, the new pulp plant is turning out the *same amount of pulp from 4 logs where formerly 5 were required*, thanks to the high efficiency of the whole-log barking and chipping process. And Weyerhaeuser feels that a major part in maintaining this high level of efficiency is being played by the G-E motors and controls.

THE TOUGHEST PULP-MILL MOTOR YET!

In addition to big barker and chipper drives, General Electric also makes a complete line of conveyor and pump motors. Newest addition to its family of tough motors for mill service is the new Tri-Clad totally enclosed induction motor, available in ratings from 1 to 1000 hp. It is designed for use in adverse atmospheres—in dampness, out of doors, in corrosive atmospheres. It gives you these important construction features:



- A cast-iron, double-wall frame completely encloses and protects the windings and punchings.
- A nonshrinking compound on motor leads protects motor interior from dust and moisture.
- A rotating labyrinth seal further protects the motor interior from damage by foreign matter.

For complete information on this and any other electric drive you may require, get in touch with your local General Electric office. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

GENERAL ELECTRIC

663-27

Kieffer Advances Edna S. Robertson

BROWNSTOWN, Ind.—Trustees of the Kieffer Paper Mills, late in August elected Miss Edna S. Robertson, Assistant Treasurer, to be general manager succeeding J. E. Kieffer. Miss Robertson has been with the company 25 years, starting as a stenographer. She gradually took on more responsibilties and higher positions until now the trustees consider her fully qualified to successfully handle the many complex problems that confront the company in taking care of their customers requirements during these strenuous times.

Elmer F. Darlage, plant superintendent, has been promoted to be general superintendent. He, like Miss Robertson, earned his position in the company, has been with the company for fourteen years, starting as a fireman and was promoted to superintendent nine years ago. His promotion to his present position is the result of his individual efforts to qualify himself for the higher position he now holds.

Tom P. Kieffer, a Purdue graduate and a nephew of Mr. J. E. Kieffer, has been appointed assistant manager and Personnel Director. He worked in the mill in various capacities during vacations while attending Purdue and after graduating he joined the U. S. Navy as an Ensign. He served three years in the South Pacific, was discharged a Lieutenant, and expects to make the paper business his life work.

Mr. Kieffer, who will remain with the company as treasurer and counsellor, started in the paper business in the old Virginia Straw Wrapping Mill at Lafayette, Indiana in 1890 and has been in the paper manufacturing business continuously since that time.

Imperial Elects Bullard To Its Directorate

HUDSON FALLS, N. Y.—A meeting of stockholders of the Imperial Paper & Color Corporation was held recently at which Harold F. Bullard was elected a director to fill the vacancy caused by the recent death of George S. Knapp. He is also vice-president in charge of production and secretary of Finch, Pruyn & Co. and was elected a director of that firm in 1935. In 1944 he was elected a director of the Moreau Manufacturing Co. and previous to then he was appointed a director of the Glens Falls National Bank and Trust Co. Other directors re-elected include Louis P. Brown, Albert L. Emerson, Albert S. Frazier, Arthur F. Brown, William Rohe, Alfred E. Van Wirt, George F. Mellen, J. Edward Singleton, William B. Plate, Karl R. McBride and Martin L. G. Wilmarth. Karl R. McBride was re-elected president. Other officers re-elected include: Martin L. C. Wilmarth, vice president; Albert S. Frazier, secretary and treasurer; Harry P. Hall, George U. Schaefer, assistant secretaries; J. J. Clarke, A. McKee Spear, assistant treasurers; William B. Plate, controller. The company also voted to donate $100,000 to the Glens Falls Hospital Building Fund.

ROBERT FAEGRE
Is Transferred to Mando Paper Division.

Johnson Heads Committee For Safety Council

MENASHA, Wis.—Al Johnson, Kimberly-Clark Corporation, was named program chairman for the year for the Twin City Safety Council at the organization meeting last week. E. E. Glomstead, Kimberly-Clark, and Paul Groth, Gilbert Paper Company, are other members of the committee.

The council will continue the program in operation last year, which featured monthly dinner meetings of foremen of the various industries of Neenah and Menasha at which safety was discussed by experts and with the aid of films. Round table discussions in which foremen described safety measures in their own plants were featured. The first of the foremen's sessions will be held October 15.

The Twin City Safety Council has been invited to be host to the annual Fox Valley and Lakeshore Safety conference next spring.

Norcross to Retire In Forestry Service

WASHINGTON—Retirement at the end of this year, of Theodore W. Norcross, chief of the engineering division of the Forestry Service since 1920, was announced by the Department of Agriculture last week.

He will be succeeded by Anthony P. Dean, since 1939, assistant regional forester in charge of engineering for California national forests. Mr. Dean was born at Berkley, Mass., studied engineering three years at M.I.T., among other preparations for his work.

Mando Names Faegre To Paper Division

MINNEAPOLIS — Robert Faegre has been appointed assistant sales manager of the Paper Division, Minnesota and Ontario Paper Company, by C. T. McMurray, vice-president in charge of sales. Mr. Faegre was first employed as special representative to the company's European subsidiary, the Insulite Company of Finland, in 1938. Since that time he has been variously occupied with export sales of insulation and hard board products and domestic sales of the company's paper products. Previous to this appointment, Mr. Faegre held the position of assistant sales manager, Insulite Division, handling the national distribution of Insulite siding products.

Mr. Faegre served as a Supply Corps Officer, USNR, from April 1942 until June 1946. During the first half of this period, he was stationed in The Bureau of Supplies and Accounts, at Washington, D. C., where he was charged with the responsibility for specifications, stock control and procurement of all paper and paper products for the entire Naval establishment. The latter two years were spent in general supply duty at naval bases in the southwest Pacific.

Mr. Faegre will headquarter in the Minneapolis office.

Mead Buys Home For City Library

WISCONSIN RAPIDS, Wis. — George W. Mead, president of Consolidated Water Power and Paper Company, has purchased the home of Mrs. Charlotte G. Witter, to present it to the city for use as a library. Mr. Mead declared last week that he would convey the title to the property to the city on condition that it be accepted for library purposes. The library board has adopted a resolution, asking the city to accept the gift.

The Common Council will act on the question at a meeting October 14. If the gift is accepted, necessary alterations will be made in the large home before the books are moved from the present library.

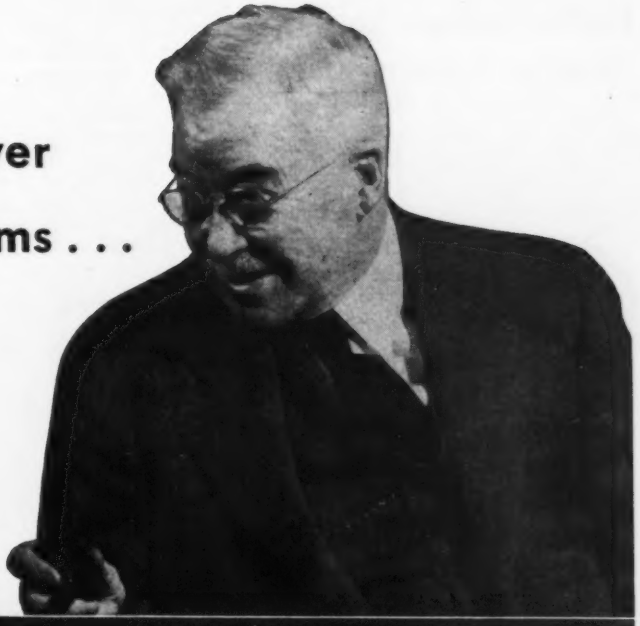
Paper Makers Chemical Promotes T. S. Morse

HOLYOKE, Mass.—Thomas S. Morse, technical service engineer at the local branch of Paper Makers Chemical department of Hercules Powder Company has been promoted to be assistant to Dr. W. P. Campbell, director of development of the Papermakers Chemical department at the company's headquarters, Wilmington, Del.

Morse was presented with a traveling bag by C. H. Kent, resident manager of the local plant, in behalf of the office and laboratory employees.

He was also guest of honor at a farewell stag dinner at River Lodge, South Hadley.

"When I want
the RIGHT answer
to my tubing problems . . .



I go to headquarters!"

. . . that headquarters is NATIONAL Tube — the world's largest producer of steel tubular products.

BECAUSE we make seamless steel tubing in the *widest* range of size and wall thickness, and in *every steel* analysis from low carbon to the finest alloy and stainless steels . . . because we've been successfully applying steel tubes to *every* industry for nearly sixty years — our recommendations to you are bound to be eminently practical and completely unbiased.

Tubing in paper mill service is so important that it deserves the *best* engineering advice you can get on its selection and use. And we are prepared to give you just that.

If your tubing applications involve unusually severe conditions—or even if they appear quite simple—we can show you how to keep tubing costs down, how to attain top efficiency in performance, how to lengthen life between replacements.

Bear this in mind:—Our purpose always is to make certain that the tubing you use will insure the most satisfaction and will save money for you. If the job can be handled by steel tubing, we will show you how it can be handled better by NATIONAL Seamless Tubing. If, on the other hand, some other material is called for, we'll be frank to tell you so.

That's why it pays to come to "headquarters" . . .

WALLS WITHOUT WELDS

NATIONAL TUBE COMPANY

PITTSBURGH, PA.

Tubing Specialties Division

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
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UNITED STATES STEEL

Kimberly-Clark Sets Up Quarter Century Club

NEENAH, Wis.—The Kimberly-Clark Corporation launched a 75th anniversary program last week in the form of a permanent organization for long-service employes. Cola G. Parker, president, at the first of four dinner-meetings, declared that when long-service honors are completed, a total of 409 Kimberly-Clark people — representing 12,250 years of service — will have been certified into a corporation quarter-century club.

Members of the corporation's executive committee will be principal speakers at the dinner-meetings.

The program is the first of its kind to be held by Kimberly-Clark and is designed to coincide as nearly as possible with that date in 1872 when the corporation produced its first pound of paper. In addition to personalized certificates of membership, all long-service employes are to receive $100 United States Savings Bonds.

Considered to be quite unusual was the position taken by the corporation at this week's inaugural that all men and women now retired on pension, whose active service had reached a quarter-century or more, would likewish share in the bond gift as an additional tribute from the company for the loyalty and long service which has existed through three generations of Kimberly-Clark people.

As further acknowledgment of its anniversary, the corporation has a historical brochure under development.

Mr. Parker said that the dinners were planned for the seventy-fifth anniversary, and paid tribute to the veteran employes for their loyalty and long service.

"When we turned our thoughts to this seventy-fifth birthday year, it was clear just what one part of that anniversary should be," he said. "It should take the form of a permanent organization of Kimberly-Clark veterans, to honor those from whose long and able service stems so much of our progress.

"There is only one regret . . . as you can see, there is hardly the space for additional guests at this gathering and still we must have a thought for those K-C'ers who were once a part of our company, with service records to compare with those in this room but who are now retired.

"There are 120 K-C'ers living in retirement today whose length of unbroken service totaled a quarter century or more. We want always to remember them as part of our group and we do on this occasion. While they retired before this club came into being, there is lying in the post office at Neenah tonight a gift to every man who retired with 25 or more years of service from those mills equivalent to that which Kimberly-Clark will make here to every active member of Kimberly-Clark's Quarter Century Club."

Mr. Parker officially welcomed Ernst Mahler, long-time executive vice-president, into the corporation's Quarter Century Club as its first member. Mr. Mahler, whose association with the company began in 1914, spoke of times gone by and the philosophy of living together that has been established over those years.

J. T. Doerfler, manager of the Kimberly mill, was the toastmaster, assisted by Cliff Williams, manager of the Atlas mill.

Hammermill Adds 39 To 20-Year Club

ERIE, Pa.—Two thousand Hammermill employes attended the company's annual picnic and outing at Waldameer Park. The picnic and outing for all of the paper plant's employes followed a formal ceremony in Rainbow Gardens for the 525 Hammermill men and women who have been employed there from 20 to 49 years.

Principal speaker at the ceremony was Norman W. Wilson of Hammermill who has been at the local paper plant 46 years and is number three in point of service.

Also speaking was General D. S. Leslie who with Mr. Wilson and Dr. Otto F. Behrend, a founder of the company, presented awards to the 134 Hammermill men and women who in 1947 celebrate 20, 25, 30, 35, or 40 year anniversaries.

Thirty-nine men and women who joined the honor roll group this year upon their completion of 20 years of continuous service were presented with gold watches and shares of company stock.

Other anniversaryites received pins of honor.

The response for the 20-year group was made by Stanley Szczesny, a member of the Hammermill paper mill division.

Stationers Elect Ahearn At Springfield Convention

PITTSFIELD, Mass.—H. T. Ahearn of Winston-Salem, N. C., was elected president of the National Engraved Stationery Manufacturers' Association as the organization concluded its recent four-day annual convention at the Hotel Sheraton. He succeeds Frank Siequist of Kansas City, Mo. Approximately 100 delegates attended.

Other officers chosen follow: Vice-president, Don Stoner of Chicago; secretary, Harry Nusmeirer of Evansville, Ind.; treasurer, Marcel Bournique of New York; manager, John A. Bresnahan of Washington, D. C.

George A. Wilkinson of Washington was the principal speaker at the closing session. His topic was "The Wage and Hour Law."

During the convention, the delegates made tours of inspection at Crane & Company, Inc., Dalton, and the Rising Paper Company in Housatonic.

Gilbert Entertains 80 at Anniversary

MENASHA, Wis.—More than 80 distributors of the Gilbert Paper Company were company guests from Sunday, September 14, to Tuesday, September 16, at the Valley Inn and North Shore Golf Club, as part of the company's sixtieth anniversary.

The conference opened at 5 o'clock Sunday afternoon at the Valley Inn, Neenah, followed by a buffet supper at 8:15. Breakfast was served at 8:30 Monday morning in the company's new cafeteria, and the guests then toured the plant. Luncheon at North Shore was followed by golf, skeet shooting, tennis and other entertainment. Dinner was served at 7:30 at North Shore. Entertainment included a male octette, a girls' trio and magic.

Breakfast Tuesday morning at the Valley Inn was followed by an inspection trip at the Institute of Paper Chemistry at Appleton. A visit to the J. J. Plank Sons shop to see the construction of dandy rolls also was on the program. Luncheon at North Shore was followed by final rounds of golf, shooting and other sports.

Morris Dobrow, executive secretary of the Writing Pulp Manufacturers Association, New York, was the featured speaker at the 7:30 dinner Tuesday evening. He discussed the future of the cotton fiber content paper business. Musical entertainment and awards also were on the program.

T. M. Gilbert, vice-president and general sales manager of the company, was general chairman of the program. He was assisted by J. D. Schmerein, entertainment; N. T. Gilbert, accommodations and transportation; and Arthur Haselow, sports. A. C. Gilbert, company president, was toastmaster at the final dinner.

Nekoosa Accepts Gift For City Park

NEKOOSA, Wis. — A $15,000 gift, presented by the Nekoosa-Edwards Paper Company to the city of Nekoosa for park purposes, was formally accepted at a meeting of the Nekoosa common council September 5.

The gift, voted by the Nepco board of directors and presented to the council by Vice-President Neil E. Nash on behalf of the company, is for the express purpose of acquiring real or personal property for the Nekoosa park system and to improve and beautify the property thus acquired. The council voted to put the money in a special fund to meet the requirements, and expressed appreciation for the gift.

Lockport Felt Elects Yates

NEWFANE, N. Y.—At a meeting of the Board of Directors of the Lockport Felt Company, held at its office in Newfane, Roy T. Yates, prominent New York City Public Relations Counsel, was elected a director.

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pulp

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CHEMICAL AND MECHANICAL WOOD PULP

After logging-off the Kansas Mountains, Paul Bunyan was horrified at the prairies that remained. So he invented reforestation. We see him here, using the axe with the flexible handle, woven from the tail combings of Babe, the blue ox.

A reproduction of this incident from the fabulous life of Paul Bunyan—the twenty-second of a series—will be sent on request. It will contain no advertising.

Westvaco Again Wins Trophy for Report

NEW YORK—For the second consecutive year the annual report of West Virginia Pulp and Paper Company was judged as best of the pulp and paper industry in the final considerations of the Independent Board of Judges in the Financial World Annual Report Survey. In this industrial classification for annual reports for 1946, Mead Corporation was runner-up; Oxford Paper Company came in third.

This year's competition in corporation financial reports was the keenest in this history of the surveys, according to the editors of Financial World. More than 3,500 attractively illustrated brochures and plainly printed booklets and pamphlets, all designated as annual reports for 1946, were considered in this year's survey. West Virginia Pulp and Paper Company's annual report for the fiscal year ending October 31, 1946, is still in the running for "Best of All Industry" awards, the silver and gold trophies which will be announced on October 10, 1947.

The Independent Board of Judges is headed by Dr. Lewis Haney, professor of economics of New York University. He is assisted by Glenn Griswold, editor and publisher of Public Relations News; Sylvia F. Porter, financial editor of the New York Post; Elmer Walzer, financial editor of the United Press; and Lester Tichy, art critic and industrial designer.

In 1945, West Virginia Pulp and Paper Company won a gold trophy in the Survey for the best four-color cover on any annual report in this country for 1944. The cover for the annual report for 1944 was a four-color reproduction of a painting by John Atherton of the paperboard machine in the Company's Charleston, South Carolina, plant, producing enough paperboard to reach the moon. The caption on the cover stated: "Paper and Paperboard for war uses roll off the Company's machines at the rate of 1 mile every 2 minutes—a two-lane highway of paper in 1944 long enough to reach the moon."

This year's cover is a four-color reproduction of a photograph of the Company's woodlands near Charleston, South Carolina, with the Charleston plant in the background. Superimposed on the photograph is a stick of pulpwood with paper unrolling from one end of it.

Norton Staff Picnics At Norton Field

WORCESTER, Mass. — At least 20,000 Norton Company employees and their families attended the annual Norton Company family outing on Norton field on September 6. Richard D. Burke was general chairman and plans consisted of everything from a pageant through a hobby show to a display by the Norton Camera club. There was refreshments, of course, and the whole affair was managed by a committee of 126 Norton employees serving under Burke.

Montville Local Stages First Annual Outing

MONTVILLE, Conn.—Montville Local No. 512, International Brotherhood of Paper Makers, AFL, held their first outing at Camp Meow on Oxoboxo Lake in Oakdale, on Labor Day. President Ralph A. Powers, Vice-Presidents Harry W. Schwartz and Edward J. Bonville of the Robertson Paper Box Company were guests of the Union.

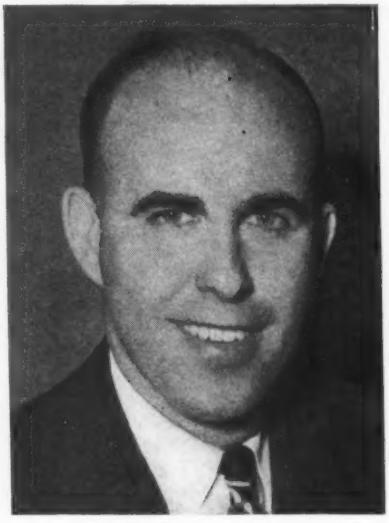
The arrangements were in charge of a committee headed by President Tufanio Pescatello and Recording Secretary John McComiskey. Angelo Cardillo dispensed the liquid refreshments. Rocco Yauilla and John Sweeney, members of the local, were the chefs in charge. They displayed a fine knowledge of the culinary arts, preparing a delicious clam bake which was served at 2 p.m.

The horseshoe pitching contest appeared to be the center of interest with Theodore Allen of the Paper Makers taking top honors in this event.

The outing proved to be such a huge success that the Union has already decided to make it an annual affair.

Loroco Buys 50 Acres To Enlarge Facilities

READING, Ohio—Arthur E. Rozin, president of Loroco Industries, Inc., has reported the purchase of 50 acres of land adjacent to their paper board mill property. This acreage is to be utilized in the erection of additional buildings and the extension of the railroad facilities.



WILLIAM H. ALLEN

Who last week was named sales manager of United Paperboard's Carton Division.

Brotherhood to Seek Taft-Hartley Repeal

MILWAUKEE, Wis.—The international executive board of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers (AFL) on September 12 called upon affiliated locals to comply with all provisions of the Taft-Hartley law.

"We are going to exercise our rights as American citizens to carry on ceaseless agitation for the repeal of this law," John P. Burke of Fort Edwards, N. Y., in announcing that the board had instructed its locals to comply with the new labor act "because it is the law of the land."

Burke said that the board's action, subject to approval by delegates to the international convention opening here this week, would affect about 470 locals. He added that all officers of the union the previous week had filed the required non-Communist affidavits with the National Labor Relations Board.

He said the board felt that the non-Communist affidavits did not involve a principle "of sufficient importance to make a fuss about."

The board's statement said:

"As much as we dislike the management-labor relations act, we have to recognize that it is the law of the land. Your international executive board is firmly of the opinion that the best course to pursue is to comply with the requirements of this law to the best of our ability and to work with the government agencies that are charged with the responsibility of administering this law."

Mechanicville Lays Out Pension Schedule

MECHANICVILLE, N. Y.—The West Virginia Pulp and Paper Company has authorized a company-wide pension plan for all employes paid on an hourly basis. The firm estimates that the pension plan will cost approximately $3 million for the past service alone besides requiring large annual payments. Provision of the plan will be similar to the system now in effect for the salaried employes of the concern. The company offered a pension plan in 1940 but it was rejected by a majority of the hourly workmen.

Approximately fifty members of the New York City branch of the company were visitors at the Mechanicville mill recently where they were explained operations in detail by members of the technical staff. They were met by a committee headed by Thomas H. Sterling, resident manager, and later served with a banquet at the Schuyler House. Upon arrival at the plant they were shown a movie depicting the progress of paper. In the afternoon they were hosts at a clamsteam at the Mechanicville Golf Club. A number of the guests attended the races at Saratoga while others visited points of interest.

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BECAUSE liquid chlorine is such an important agent in paper production, many leading paper manufacturers all over the country look to Pennsalt as their source of this vital bleaching chemical.

Pennsalt was a pioneer in liquid chlorine production in this country, and for nearly half a century has supplied a high quality chlorine to Industry.

PENNSALT PRODUCTS for the Pulp and Paper Industry: Liquid Chlorine • Bleaching Powder • Corrosion-Proof Cements • Anhydrous Ammonia • Acids • Perchloron® • Sodium Chlorate • Potassium Chlorate • Sodium Arsenite • Sodium Hypochlorite • Hydrogen.

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FINANCE

Bathurst Reports Net $755,000 for 6 Months

MONTREAL, Que.—In a statement of consolidated earnings for the six months ended June 30, 1947, Bathurst Power & Paper Company, Ltd., reports estimated net profit of $755,290, after depreciation and taxes.

The company states the figures are not comparable with those reported for the first half of last year, as the 1947 figures include earnings of two shipping container subsidiaries.

Last year the company reported estimated net profits of $294,523 for the first half of 1946, equal to 73½ cents per share of "A" stock.

Indicated earnings in the second quarter of 1947 are equal to $1.14 per "A" share, against 75 cents in the first quarter.

As at June 30, 1947, current assets amounted to $6,469,398, including $755,290 in marketable securities, while current liabilities were $2,613,315, indicating net working capital of $3,856,083, against $3,419,948 on March 31, 1947, and $3,286,165 at the close of 1946.

Before provision for depreciation, depletion and income taxes, the earnings in the first half of 1947 amounted to $1,650,941. Provision for depreciation and depletion was $307,291, and provision for taxes was $588,360.

On a participating basis the earnings for the first half of 1947 are equal to $1.50 per share on the "A' stock and 50 cents per share on 300,000 "B" shares.

Great Lakes Bonds Are Offered to Public

TORONTO, Ont. — Offering is being made of a $1,750,000 issue of 3½ percent first sinking fund bonds of Great Lakes Paper Co., at $100 and accrued interest. The offering is being made by Gardiner & Company, Wood Gundy & Company, and McLeod, Young, Weir & Company.

The new series is the balance of a $6,500,000 issue authorized in 1946 and the proceeds from the sale are to be used to complete a program for increased capacity and efficiency of the mill.

Hooker Issues Warrants For $5 Stock Purchases

NIAGARA FALLS, N. Y.—Warrants to purchase shares of $5 par value common stock of the Hooker Electrochemical company, in the ratio of one share for each five shares held at the close of business September 2 were issued to stockholders of the company.

"The fact that you may still hold your old certificate of $10 par value common stock has not affected the number of warrants you are receiving," a company announcement to stockholders stated, "since each share of $10 par value stock represents two shares of $5 par value stock."

The announcement added that a registration statement covering the 134,034 shares of common stock of $5 par being offered, as well as the Securities and Exchange commission.

Enders Reviews Year Of United Paperboard

NEW YORK—The financial condition of United Paperboard Company and and the results of its operations for the fiscal year which ended May 31, 1947 were reported last week in a review of the company's position by President Fred Enders.

From the net earnings of $1,262,628.09, a dividend of $37,728.00, or $6.00 per share was paid on the preferred stock on May 28, 1947 to stockholders of record as of May 23, 1947. This left $1,224,900.09 (or $5.11 per share) earned on the common stock. A dividend of $1.00 per share was paid on the common stock on May 28, 1947, to stockholders of record as of May 23, 1947.

The capital surplus of the company was increased by $7,651.10 through the purchase of 1,316 shares of preferred stock, with a total par value of $131,600.00 for the sum of $123,948.90.

Dollar sales volume increased over the previous year, due largely to a combination of increased production of both board and cartons, and higher prices. No serious stoppages of any kind were experienced at any of the plants during the year, but certain types of raw materials continued to be scarce during the entire period, and still remain so.

During the year the company acquired an interest in a corporation formed to engage in the lamination of foil and coating adhesives on board and other materials. This is a highly specialized field and one which it is believed should eventually prove profitable.

The company has for a number of years owned a majority interest in the

FINANCIAL RECORD OF THE WEEK

New York Stock Exchange

High, Low and Last for Week Ending September 13, 1947

STOCKS

	High	Low	Last
A. P. W.	4⅛	4	4
Armstrong Cork Co.	46¾	45½	45½
Armstrong Cork Co., pf.	108½	107⅜	108
Celotex Corp.	28¼	27	27½
Celotex Corp., pf.	20⅛	20⅛	20⅛
Certain-Teed Products Corp.	17⅜	15⅞	16⅜
Certain-Teed Products Corp., pf.	....	....	....
Champion Paper & Fibre Co.	23½	22⅞	23¼
Champion Paper & Fibre Co., pf.	110	109½	109½
Congoleum Nairn Co.	29⅞	29⅛	29¾
Container Corp. of America	41¼	39⅛	40
Container Corp. of America, pf.	102⅝	100½	100½
Crown Zellerbach Co.	31½	30⅝	31¼
Crown Zellerbach Co., pf. 4.20	106	105½	105⅞
Crown Zellerbach Co., 4 pf. 4	117¾	116½	117¼
Dixie Cup Co.	40	38	40
Dixie Cup Co., A	....	....	....
Flintkote Co.	34¼	31⅞	34⅛
Flintkote Co., pf.	107⅝	107½	107½
Robert Gair	9⅛	8⅝	8⅞
Robert Gair, pf.	20	20	20
International Paper Co.	48½	46⅝	48
International Paper Co., pf.	107⅛	106½	107⅛
Johns-Manville Corp.	41¼	39¾	41
Johns-Manville Corp., pf.	115¾	115¾	115¾
Kimberly-Clark Corp.	24	23⅛	23⅛
Kimberly-Clark Corp., pf.	110¼	109¼	110
MacAndrews & Forbes	147	147	147
MacAndrews & Forbes, pf.	37¼	37	37
Marathon Corp.	23½	22¾	23⅜
Mead Corp.	20⅜	19¾	20⅜
Mead Corp., pf. 4¼	95	95	95
Mead Corp., pf. 2	45½	45½	45½
National Container Corp.	13⅞	13⅜	13⅜
Paraffine Companies, Inc.	....	....	....
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	26⅜	25⅜	26⅛
Rayonier, Inc., pf.	37¾	37¼	37½
Ruberoid Co.	56	54	56
St. Regis Paper Co.	10¼	9⅜	9⅞
St. Regis Paper Co., pf.	95	94	95
Scott Paper Co.	46⅝	46⅜	46⅝
Scott Paper Co., pf.	102½	102½	102½
Sutherland Paper Co.	41¼	39¾	39¾
Union Bag & Paper Corp.	33⅜	32	32½
United Paperboard Co.	15¾	15⅛	15⅜
U. S. Gypsum Co.	101	98	100½
U. S. Gypsum Co., pf.	189	188	188
West Virginia Pulp & Paper Co.	41½	40	40
West Virginia Pulp & Paper Co., pf.	111½	111	111½

BONDS

Celotex Corp., 3¼s '60	104½	104⅛	104½
Certain-Teed Products Corp., 5½s '53	....	....	....
Champion Paper & Fibre Co., 3s '65	....	....	....
Mead Corp., 3s '68	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending September 13, 1947

STOCKS

	High	Low	Last
Great Northern Paper Co.	45	43½	45
Taggart Corp.	10	10	10

BONDS

American Writing Paper Co., 6s '61	....	....	....

PANDIA FIBRILATOR

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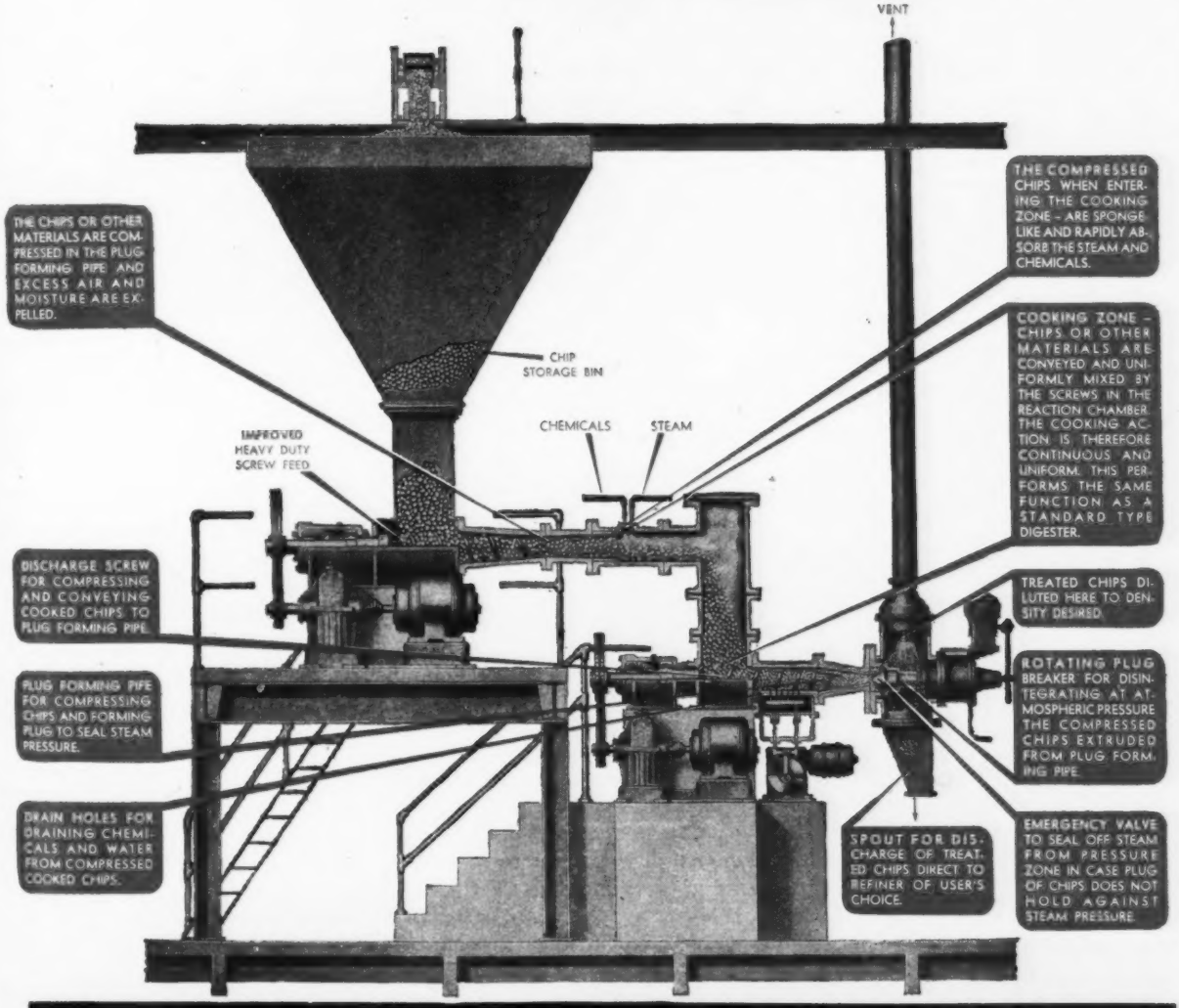
For continuous production of Wood, Straw, and Bagasse Pulps suitable for the manufacture of special fibres for industrial uses such as Insulation and Harboard, Plastics, etc. Built for working pressures up to 300 lbs. Capacities up to 50 tons. Reasonably priced. Now in production. Refiner of customer's choice.


VENT
THE CHIPS OR OTHER MATERIALS ARE COMPRESSED IN THE PLUG FORMING PIPE AND EXCESS AIR AND MOISTURE ARE EXPELLED.
THE COMPRESSED CHIPS WHEN ENTERING THE COOKING ZONE – ARE SPONGE LIKE AND RAPIDLY ABSORB THE STEAM AND CHEMICALS.
COOKING ZONE – CHIPS OR OTHER MATERIALS ARE CONVEYED AND UNIFORMLY MIXED BY THE SCREWS IN THE REACTION CHAMBER. THE COOKING ACTION IS THEREFORE CONTINUOUS AND UNIFORM. THIS PERFORMS THE SAME FUNCTION AS A STANDARD TYPE DIGESTER.
CHIP STORAGE BIN
CHEMICALS
STEAM
IMPROVED HEAVY DUTY SCREW FEED
DISCHARGE SCREW FOR COMPRESSING AND CONVEYING COOKED CHIPS TO PLUG FORMING PIPE.
TREATED CHIPS DILUTED HERE TO DENSITY DESIRED.
PLUG FORMING PIPE FOR COMPRESSING CHIPS AND FORMING PLUG TO SEAL STEAM PRESSURE.
ROTATING PLUG BREAKER FOR DISINTEGRATING AT ATMOSPHERIC PRESSURE THE COMPRESSED CHIPS EXTRUDED FROM PLUG FORMING PIPE.
DRAIN HOLES FOR DRAINING CHEMICALS AND WATER FROM COMPRESSED COOKED CHIPS.
SPOUT FOR DISCHARGE OF TREATED CHIPS DIRECT TO REFINER OF USER'S CHOICE.
EMERGENCY VALVE TO SEAL OFF STEAM FROM PRESSURE ZONE IN CASE PLUG OF CHIPS DOES NOT HOLD AGAINST STEAM PRESSURE.

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P&I Products: **Chemipulper with PandIA Fibrilator (for Continuous Cooking Wood, Straw, Bagasse Pulp and other Cellulosic Materials). Morley Continuous Straw Cooking Apparatus and Process. Roll-O-Finer and Smith-Egan Beater. Brammer Recording Consistency Control. PandIA Screw Feed replacing Plunger Feeds on the Asplund Defibrator.**

Lowman Folding Box Corporation, Syracuse, New York. The outstanding minority stock has been acquired during the last fiscal year. In June 1947 this subsidiary was dissolved and its business and assets were taken over directly by the company. It is believed that this will result in a more economical and efficient operation.

During the year under review progress was made in furthering the management's policy of increased use of the company's production of board for the manufacture of cartons at the company's own plants. This necessitated the building up of a larger and more efficient sales organization and while considerable strides have been made in that direction, more progress is anticipated in the future. In connection with the development of better standards of quality, expenditures for plant improvements will become an increasing necessity. A program has been initiated for this purpose, covering a period of several years.

During the year a non-recurring loss was sustained through the disposal of the properties of the company situated in the State of Maine, which the board of directors had determined were no longer useful in the business of the company.

During the fiscal year extra-compensation aggregating $36,500.00 was paid to five officers in recognition of their contribution to the results secured.

New Solvay Bulletin Treats Of Water Problems

A new technical bulletin on water treatment is being offered to chemists and engineers responsible for water supply problems in industrial plants, water supply departments, power stations and ice plants. Containing 94 pages, this bulletin has sections on softening, purification, taste and odor removal, corrosion control, boiler feed water treatment, the use of alkalies, chlorine and other chemicals and equipment, as well as lists of standard reference works on many of the subjects covered.

This new bulletin is Technical and Engineering Bulletin No. 8, "Alkalies and Chlorine in the Treatment of Municipal and Industrial Waters," and is offered without charge by the Advertising and Sales Promotion Department of Solvay Sales Corp., 40 Rector St., N. Y. 6.

Newsprint Arrives at Jacksonville Port

JACKSONVILLE — With shipments direct from Scandinavia resumed, some 750 tons of newsprint will reach Jacksonville every four months, it was estimated by the Jacksonville Traffic Bureau.

Two lots of newsprint already have arrived — one aboard the Swedish steamship Uddeholm last month. The next vessel due is the S.S. Tortugas which will sail from Finland, arriving in Jacksonville in September.

The cargo has been arriving here through the Welhelmsan Line and the Swedish Amerika Gulf Line. Strachan Shipping Company is agent for the service in Jacksonville. Some newsprint is used locally, some is reshipped to the interior of Florida.

NEPCO Grants Cash To Home-Builders

PORT EDWARDS, Wis.—Extension of a plan to assist employes in building their own homes has been made public by the Nekoosa-Edwards Paper Company. The plan was originally put into effect in July, 1946, when the company offered financial aid to employes building homes in Nekoosa or Port Edwards in an effort to ease the critical housing situation.

Under the extension of the plan a grant of $300 will be made to each employe who has commenced or will commence building a home for his own occupancy in Nekoosa or Port Edwards during the current year of 1947. Applications for the cash grants are to be made to C. A. Jasperson, company secretary-treasurer. The application will then be reviewed by the Nekoosa-Edwards housing committee before approval is given.

In addition to encouraging home building in Port Edwards and Nekoosa with cash grants, the company will assist employes in any way possible in the securing of building materials. The offering of cash grants to home builders is part of an over-all Nekoosa-Edwards plan to relieve congested housing conditions in the two towns where the company owns and operates pulp and paper mills.

Actions already taken toward this goal were the construction in 1946 of Nepco Court, an eight-family apartment building in Port Edwards; the improvement of 25 lots on the north side of Port Edwards; and the moving of several small company homes to new locations to provide additional lots for employes desiring to build their own homes.

Polymer Industries Names Austin in New England

ASTORIA, N. Y.—Polymer Industries, Inc., of 11-08 30th Ave., has appointed J. J. Austin, with offices at Concord, Mass., as its sales agent for New England to handle its adhesives and impregnants for the paper converting industries. Mr. Austin who was formerly with Dewey and Almy Chemical Company is an active member of the Institute of Food Technologists and the Technical Association of the Pulp and Paper Industry. He is also connected with Austin Industries, with offices at Concord, Mass.

Harris-Seybold Co. Increases Shipments

CLEVELAND — Harris-Seybold Company, leading manufacturer of offset lithographic printing presses, power paper cutters, and related products, reports consolidated net earnings of $960,292 for the fiscal year ended June 30, 1947. Earnings were equivalent to $6.47 per share of common stock after allowance for dividends on preference stock. Net earnings last year were $387,967, equivalent to $2.21 per share of common stock.

The annual report to stockholders and employes states that the earnings indicated were reflected in the last two quarters as a result of increased shipment volume during those quarters, together with more equitable prices and substantial reconversion progress. The report further states that while the Company is in a favorable position for the coming year, recognition must be given to continuing economic readjustments and uncertainties in the year ahead.

Net sales for the year of $11,890,672 consisted almost entirely of shipments of regular peacetime products. The Company's postwar objective of approximately 2½ times average prewar shipments, in terms of physical volume, was attained in the last quarter.

Consolidated balance sheet showed current assets of $9,316,665 which included $2,291,459 in cash and government securities. Current liabilities of $4,799,315 included bank borrowings of $1,900,000 and advance payments of $1,013,241 by customers on unfilled orders.

Dr. Taylor Joins Wyandotte As Research Supervisor

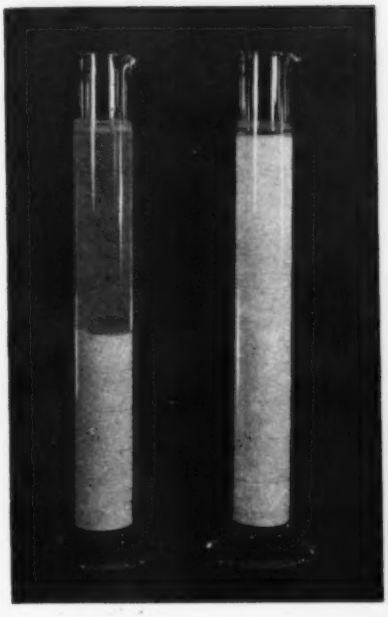
NEW YORK — Dr. A. Lloyd Taylor, formerly vice-president in charge of research and development for H. L. Shaw and Sons of Portsmouth, New Hampshire, and Boston, Massachusetts, has accepted a position as research supervisor in the Wyandotte Chemical Corporation Research Laboratories where his experience will be applied in the field of industrial detergents. In addition to his work on detergents in his last position, Dr. Taylor has had many years' experience in the same field as director of research for Oakite Products and as director of the Department of Chemistry for Pease Laboratories, New York.

Stationers Inspect Crane Plant

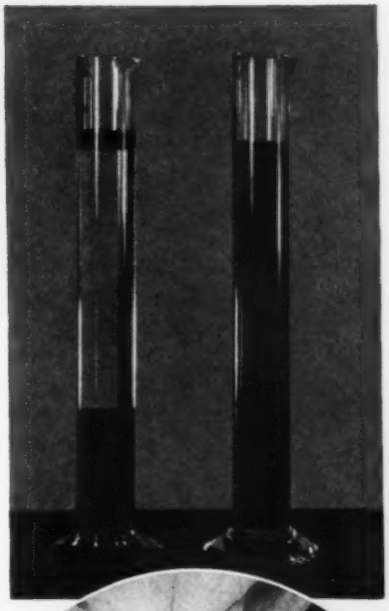
DALTON, Mass.—About 100 members of the Engraved Stationery Manufacturing Association were the guests of Crane & Company, Inc., for luncheon at the Irving House recently. After the meal, the guests were taken on a tour of the Crane stationery division.

THESE PICTURES TELL THE STORY OF THE

Dispersive Action OF Calgon ON PIGMENTS

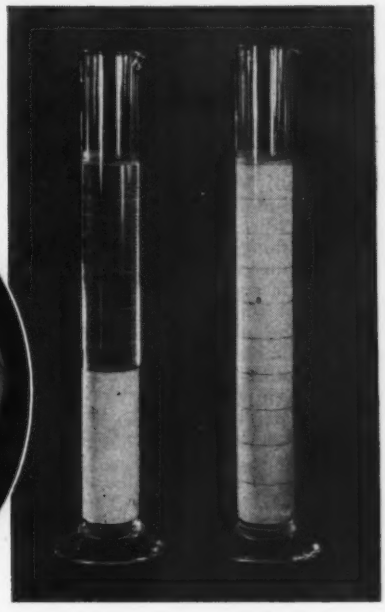


▲ **Titanium oxide slurry** (15%)
—after standing 23 hours. Calgon (8/10 of 1%) has been added to the one at the right.



◀ **Iron oxide slurry** (20%)
—after standing 23 hours. Calgon (1%) has been added to the one at the right.

▼ **Clay slurry** (15%)
—after standing 5 hours. Calgon (3/10 of 1%) has been added to the one at the right.



Clay slurry ▶ (60%)
Calgon (3/10 of 1%) has been added to the one at the right.

If you are interested in improving the dispersion of pigment in your coating mix, write us for information regarding the application of Calgon to your process.

*T.M. Reg. U.S. Pat. Off.

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HALL
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CALGON

calgon, inc.

A SUBSIDIARY OF
HAGAN CORPORATION

HAGAN BUILDING
PITTSBURGH 30, PA.

Lukens Group Plays Host to Visitors

COATESVILLE, Pa. — More than a hundred industrial, civic and publishing friends of the Lukens Steel Company and its affiliates were guests on September 11 at an inspection of the mills and at a dinner in the evening. With a cordial welcome from President Robert W. Wolcott to greet them and under the skilled leadership of trained guides the visitors were taken through the entire set of mills, from open hearth furnaces to the Lukenweld plants and the nickel-cladding departments.

The tour started from the main office building by bus to the West Lincoln Highway gate to the open hearth department. Here, at first hand, were seen the precise procedure of making basic steel in Lukens ten open hearth furnaces which turn out 624,000 tons of ingots a year. After witnessing the process in which pig iron, steel scrap and other ingredients, including limestone which acts as a purifier, are melted, the group saw the tapping of a furnace with its cascading molten metal falling into a ladle, with slag overflowing into "thimbles" below. The full ladle, handled with ease by a 150-ton crane, is carried to a pouring platform where the metal is bottom-poured through a system of runners into molds in which ingots weighing from 700 lbs. to 110,000 lbs. can be cast.

From Lukens open heart department, the group walked to the 206 in. mill to observe operations on the world's largest plate mill. Plates to 195 in. wide, up to 25 in. thick can be rolled on this mill — the largest size obtainable anywhere in the world. The group saw the 140 in. mill in operation as a single finishing unit or as a breakdown mill in connection with the 206 in. mill.

Next, the group visited the flanging department where they got close-hand views of the spinning of large diameter heads for tanks, boilers, pressure vessels and other uses. Heads up to 18 ft. 2½ in. in diameter or up to 6 in. thick and weighing as much as 17 tons can be spun in Lukens flanging department.

From the flanging department, the visitors took a short walk to plants 5 and 4 of By-Products Steel Corporation to witness flame-cutting operations. More than 50 flame-cutting machines, from single-torch radiagraphs to 22-torch pantagraphs are in operation in these two plants which are noted for their specialized flame-cutting of steel plate shapes for diversified industrial uses. Also, to be seen here are a number of hydraulic presses for forming an flattening work, and modern annealing furnaces for heat treating steel plates and shapes.

From plant 5, buses took the visitors to Lukenweld, Inc., plant 1. There they saw the welding of steel plate structures such as jacketed drier rolls, diesel engine frames, and other custom made weldments most of which are engineered in Lukenweld plants. The group then went to Lukenweld plant 2 to witness the fabricating of large or specialized weldments and the erecting of machinery such as earth-moving equipment, auto truck bodies, drying units, from steel plate components. In addition, the visitors saw the modern machine shop, with its lathes, planers, saws, drill presses, boring mills, cutters and other equipment in one of the most complete plants to be seen anywhere.

From the Lukenweld plants, buses took the group to the 120 in. mill to witness the operations on the 2000-foot plate production line. The 120 in. mill has the most advanced electrical and mechanical equipment to be seen anywhere for producing substantial quantities of steel plates.

From the south end of the 120 in. mill, the visitors went to the nickel cladding department to see the making of Lukens clad steels. This is a process by which a light layer of clad material — nickel, stainless steel, inconel, or monel — is bonded uniformly and permanently to a backing plate of mild steel.

From the nickel clad department, the group visited plants 1, 2 and 3 of By-Products Steel Corporation to witness fabricating operations. In plants 1 and 2, these operations include bending, shearing, pressing, punching and blanking. In By-Products plant 3 the visitors saw some of the huskiest equipment for forming or shaping heavy steel plate. The 1000-ton and the 1500-ton hydraulic presses on which heavy steel plate is pressed or formed are in this building.

From plant 3 the group boarded buses for the return to the main office building.

Little Adds Nine To Research Staff

CAMBRIDGE, Mass.—Additions to its technical staff by Arthur D. Little, Inc., industrial research organization, are part of a substantial staff expansion during the current year. Growing interest in research, combined with the wartime deficit in technical education, has made technically trained personnel very scarce for the present and the immediate future, the company reports.

Recent staff additions include Russell J. Bowen, who recently completed study for a Master's Degree in chemical engineering at M.I.T.; Robert W. Fabian, formerly engaged in governmental research at Wesleyan University; Thomas Hall, recently granted an M.S. in organic chemistry by Tufts College; William V. Keary, chemical engineer formerly with Publicker Industries, Inc., Eddington, Pa.; Benjamin A. Lambert, chemical engineer previously with Polaroid Corp., Cambridge, Mass.; Albert E. Mignone, mechanical engineer and formerly Research Director for the U. S. Naval Torpedo Station, Newport, R. I.; George E. Richter, electronics engineer previously with Ruge-deForest, Cambridge, Mass.; Richard W. Tindal, economic analyst, formerly operating his own manufacturing business in Springfield, Mass.; and Elizabeth Thoregood, biologist formerly engaged in teaching.

Oakite Stages Series Of Technical Meets

NEW YORK—How new products and methods in the field of industrial cleaning and allied procedures are helping to lower production costs will be the theme of each of four regional technical-sales conferences to be held throughout the country from September through November, 1947 by Oakite Products, Inc.

The first conference was held on September 8-10, inclusive, at the Palmer House, Chicago, Ill., launching a series of lectures and round-table discussions on the new materials which have emerged from the Oakite technical laboratory during the past year. Members of the Central, Chicago and Detroit divisions of the Company will participate in a resume of methods of applying the new chemical materials in industry. Special reports on food processing, metals, automotive and railway transportation, milk products will be featured.

Oakite research chemists, service engineers and technical specialists will participate with the field service representatives in each of the technical-sales meetings.

New Oakite products to be highlighted on the conference agenda include an improved-type deodorizing agent for food and beverage plants; a mold and slime retardant for use in humidifying systems; specially designed detergents for automatic and hand dishwashing; a new, balanced cleaner that prepares brass and copper articles for high-lustre bright plating; a self-emulsifying solvent for cleaning metal parts in spray washing machines.

The second in the series of regional conferences was held September 15th, 16th and 17th at the Coronado Hotel, St. Louis, Mo. This meeting will include representatives of the Midwestern, Southern and Southwestern divisions of the Oakite organization.

The New York, New England and Philadelphia divisions will begin the third meeting at the Hotel Commodore in New York on October 6th and conclude October 8th.

The St. Francis Hotel, San Francisco, California is scheduled to be the scene of the fourth conference on November 17th and 18th, in which members of the North and South Pacific Coast divisions will participate.

Oakite Products, Inc., New York, provides more than 70 different specialized materials to American and Canadian industry for a wide range of cleaning and related tasks.

Typical scene in magazine editorial office of the 1850's

Magazines for the Millions

America's first magazine was published in 1741. During the next century many were started, but only one, *Godey's Lady's Book*, attained a circulation of as much as 150,000.

Not until the discovery of the wood pulp process made paper plentiful did magazines bring to largely increasing numbers what Dr. James G. Holland, an early editor of *Scribner's*, called "the intellectual food of the people."

Today more than 700 magazines with a total circulation of more than 110 million copies carry culture and entertainment to the home, and their advertising pages stimulate low cost distribution of a huge volume of consumer goods. Thus magazines, made possible by plentiful paper, have helped to make the United States the best informed of all nations, with the highest standard of living in the world.

The dramatic story of paper is told in the sound-and-color film, "Paper — Pacemaker of Progress," and in a book under the same title. Both are presented by F. C. Huyck & Sons as a tribute to the Paper Industry. The book will be sent free upon request.

F. C. HUYCK & SONS • *Kenwood Mills* • ALBANY, NEW YORK

KENWOOD WOOL PRODUCTS

HUYCK *Felts*

Congress Receives Bids For Fourth Quarter Paper Supply

(Continued from page 7)

No. 10—150,000 lbs., English finish, 25x38—90; flat, cut any size, min. width 24 ins., max. width 48 ins.

Paper Corp. of America ..... .1625c

Offset Book

No. 19—350,000 lbs., 25x38—80; flat, cut any size, min. width 24 ins., max. width 48 ins., the grain to run lengthwise of the sheet.

Paper Corp. of U. S. (200,000 lbs. only) ..... .1575c
Paper Corp. of America ..... .165c
Central Ohio Paper Co. (150,000 lbs. only, Lot 19 or 20) ..... .1325c

No. 20—2,500,000 lbs., 25x38—100; flat, cut any size, min. width 24 ins., max. width 48 ins., the grain to run lengthwise of the sheet.

Whitaker Paper Co. (350,000 lbs. total on Lots 20 and 53) ..... .1057c
Paper Corp. of U. S. (300,000 lbs. only) ..... .1475c
Paper Corp. of America ..... .16c
Mudge Paper Co. (200,000 lbs. only) .1149c
Central Ohio Paper Co. (150,000 lbs. only) ..... .1163c
Central Ohio Paper Co. (150,000 lbs. only) ..... .1205c

Antique Book

No. 22—100,000 lbs., 25x38—90 and 120; flat, cut 32x42, 33x43, and 38x50 ins.

Paper Corp. of America ..... .1575c
Mead Sales Co. (120 lbs. only) ..... .1077c

Lightweight Machine-Finish Book

No. 23—75,000 lbs., 25x38—60; flat, cut 28x38 and 38x48 ins.

Walker, Goulard & Plehn Co. (Carload Lots only) ..... .21c

50% Antique Book

No. 27—20,000 lbs., 25x38—80; flat, cut 22¾x3½ ins., shall be suitable for writing on with ink.

Whitaker Paper Co. ..... .223c
Paper Corp. of U. S. ..... .198c
Walker, Goulard & Plehn Co. (Carload Lots only) ..... .21c
Wilcox, Walter, Furlong Paper Co. .. .23c
Howard Paper Mills, Inc., Aetna Division ..... .243c

50% Laid Antique Book

No. 29—50,000 lbs., 25x38—140; flat, cut 38x48 ins.; the laid marks to run the 38-in. direction of the sheet; the grain and chain marks to run lengthwise of the sheet.

Whitaker Paper Co. ..... .2172c
Paper Corp. of U. S. ..... .1865c
R. P. Andrews Paper Co. ..... .2115c
Barton, Duer & Koch Paper Co. ..... .211c

Supercalendered Book

No. 33—900,000 lbs., 25x38—90; flat, cut any size, min. width 24 ins., max. width 48 ins.

No. 34—700,000 lbs., 25x38—90; rolls, 28½ and 38 ins. wide (3-inch fiber cores).

R. P. Andrews Paper Co. (700,000 lbs. only) ..... .0858c
Mead Sales Co. (300,000 lbs. only) .. .1644c

Coated Book

No. 37—900,000 lbs., 25x38—100; flat, cut any size, min. width 24 ins., max. width 48 ins.

Barton, Duer & Koch Paper Co. ..... .1161c

No. 38—200,000 lbs., 25x38—120; flat, cut any size, min. width 24 ins., max. width 48 ins.

Barton, Duer & Koch Paper Co. ..... .108c

No. 40—450,000 lbs., 25x38—140; flat, cut 32x42, 38x48, 39x50, and 41x52 ins.; the grain to run lengthwise of the sheet.

Consolidated Water Power and Paper Co. ..... .10739c

Litho Coated Paper

No. 41—50,000 lbs., 25x38—140; flat, cut 32x42, 38x48, 39x50, and 41x52 ins.; the grain to run lengthwise of the sheet.

Dull Coated Book

No. 42—40,000 lbs., 25x38—140; flat, cut 28x41, 32x42, and 38x48 ins.; the grain to run lengthwise of the sheet.

Chemical Wood Mimeographed, White and Colored

No. 45—80,000 lbs., white, No. 40; flat, cut 28½x34½, 32½x42½, and 38x48½ ins. Grain: Size 28½x34½ ins. to run the 28½ in. way; size 33½x42½ to run the 42½ in. way; size 38x48½ in. to run the 38 in. way.

Paper Corp. of America ..... .16c
R. P. Andrews Paper Co. ..... .0921c

No. 46—40,000 lbs., blue, buff, green, pink, and yellow, No. 40; flat, cut 32½x42½ and 38x48½ ins. Grains: Size 32½x42½ to run the 42½ in. way; size 38x48½ to run the 38 in. way. Min. order, one color, 10,000 lbs.

Paper Corp. of America ..... .1675c

25% Mimeograph

No. 47—450,000 lbs., No. 40; flat, cut 28½x34½, 32½x42½, 34½x44, 38x48½, and 40½x42½ ins. Grain: Size 28½x34½ ins. to run the 28½ in. way; sizes 32½x42½ and 40½x42½ ins. to run the 42½ in. way; size 38x48½ ins. to run the 38 in. way.

Paper Corp. of U. S. (100,000 lbs. only) ..... .172c
Paper Corp. of U. S. (200,000 lbs. only) ..... .1745c
Wilcox, Walter, Furlong Paper Co. (225,000 lbs. only) ..... .1665c
Howard Paper Mills, Inc., Aetna Division ..... .1638c
Bulkley, Dunton Co. (225,000 lbs. only) .1665c
Old Dominion Paper Co. (200,00 lbs. only) ..... .1547c
Old Dominion Paper Co. (400,000 lbs. only) ..... .1623c

Duplicator Copy Paper, Liquid Process, White and Colored

No. 48—50,000 lbs., White, No. 40; flat, cut 32x42 and 34x44; the grain to run lengthwise of the sheet.

Paper Corp. of America ..... .16c
Stanford Paper Co. (Price at time of shipment) ..... .156c

Blue U S M O Safety Writing

No. 50—400,000 lbs., No. 32; rolls, 22 ins. wide, 24 ins. in diameter (3-inch fiber cores).

R. P. Andrews Paper Co. (150,000 lbs. only) ..... .1937c
D. L. Ward Co. (200,000 lbs. only. Price at time of shipment) ..... .1881c

Chemical Wood Writing, White and Colored

No. 52—50,000 lbs., white, No. 26; flat, cut any size, min. width 21 ins., max. width 48 ins.

No. 53—2,000,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.

Whitaker Paper Co. ..... .1071c
Paper Corp. of America ..... .165c
R. P. Andrews Paper Co. (800,000 lbs. only) ..... .1009o
Stanford Paper Co. (Price at time of shipment. 250,000 lbs. only) ..... .1205c
D. L. Ward Co. (Price at time of shipment. 250,000 lbs. only) ..... .1401c

No. 54—1,500,000 lbs., white, No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.

Paper Corp. of America 1fc

No. 55—400,000 lbs., white, No. 32; rolls, min. width 16 ins., max. width, 48 ins. (3-inch fiber cores).

Paper Corp. of America ..... .155c
Walker, Goulard, Plehn Co. (200,000 lbs. only) ..... .165c
R. P. Andrews Paper Co. (400,000 lbs. only) ..... .097c
Stanford Paper Co. (Price at time of shipment. 250,000 lbs. only) ..... .11c
Mead Sales Co. ..... .1068c

No. 56—300,000 lbs., white, No. 40; rolls, min. width 16 ins., max. width 48 ins. (3-inch fiber cores).

Paper Corp. of America ..... .15c
Walker, Goulard, Plehn Co. (200,000 lbs. only) ..... .16c
R. P. Andrews Paper Co. (300,000 lbs. only) ..... .0848c
Mead Sales Co. ..... .101c

No. 58—350,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, Nos. 32 and 40; flat, cut any size, min. width 21 ins., max. width 48 ins. Min. order, one color, 10,000 lbs.

Paper Corp. of America (32 lbs. only) .1725c
Paper Corp. of America (40 lbs. only) .1675c

No. 59—100,000 lbs., blue, buff, green, pink, salmon, and yellow, No. 32; rolls, 38 in. (3-inch fiber cores).

Paper Corp. of America ..... .1625c
Mead Sales Co. ..... .1238c

Chemical Wood, Writing (Titanium Dioxide Filled)

No. 61—250,000 lbs., No. 32; flat, cut 34x44 ins.

Paper Corp. of America ..... .175c
Barton, Duer & Koch Paper Co. ..... .1315c

50% Lithograph-Finish Map

No. 64—20,000 lbs., Nos. 32 and 40; flat, cut any size, min. width 22 ins., max. width 48 ins., the grain to run lengthwise of the sheet.

Paper Corp. of U. S. ..... .207c
Howard Paper Mills, Aetna Division .209c
Barton, Duer & Koch Paper Co. .... .209c

High Wet Strength Map

No. 68—240,000 lbs., No. 48; flat, cut any size, min. width 22 ins., max. width 48 ins.; grain to run lengthwise of the sheet.

50% White Chart, Lithograph-Finish

No. 69—150,000 lbs., white, No. 72; flat, cut any size, min. width 22 ins., max. width 46 ins.; the grain to run lengthwise of the sheet unless otherwise specified.

Barton, Duer & Koch Paper Co. .... .228c
Stanford Paper Co. ..... .2185c
Franklin Research Co. ..... .2515c

Chemical Wood, Manifold, White and Colored

No. 72—80,000 lbs., white, No. 18; flat, cut 21x32, 28x34, 32x42, and 34x44 ins.

Frank Parsons Paper Co. ..... .1722c

No. 74—30,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 18; flat, cut 28x34, 32x42, and 34x44 ins.; min. order, one color, 5,000 lbs.

Frank Parsons Paper Co. (10,000 lbs. min. order colors—cherry and salmon) .1858c

An
OUTSTANDING
COLOR
for
PAPER

Du Pont
MOLYBDATE ORANGE YE-428-D

Here's a versatile pigment that's a "MUST" for your colored paper. Du Pont Molybdate Orange YE-428-D has the desired characteristics of exceptional covering power, excellent strength and superior brilliance. It's a color which blends well with either yellow or red—to give truly distinctive tones.

Molybdate Orange YE-428-D is standardized for both beater and coated paper uses. It can be used in flinting and frictioning—wets readily with water—mixes well with casein and other sizes—won't bleed in water. And it's best for economy—compared to either organic orange pigments or regular chrome orange pigments.

Try Du Pont Molybdate Orange YE-428-D on your next coloring job—whether it is fancy printed paper, coated paper or twisting paper. Ask your Du Pont salesman for details or write E. I. du Pont de Nemours & Co. (Inc.), Pigments Department, 1007 Market Street, Wilmington 98, Del

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DU PONT
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BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

50% Manifold White and Colored

No. 75—20,000 lbs., white, No. 14; flat, cut 32x42 ins. Min. order, 5,000 lbs.

Whitaker Paper Co. ..... .3739c
R. P. Andrews Paper Co. ..... .379c
Barton, Duer & Koch Paper Co. .... .30468c

No. 76—30,000 lbs., white, No. 18; flat, cut 21x32, 28x34, 32x42, and 34x44 ins.

Whitaker Paper Co. ..... .3335c
Paper Corp. of U. S. ..... .319c
R. P. Andrews Paper Co. ..... .29c
Barton, Duer & Koch Paper Co. ..... .3185c
Old Dominion Paper Co. ..... .30468c

Chemical Wood Bond, White and Colored

No. 102—300,000 lbs., white, No. 40; flat, cut any size, min. width 21 ins., max. width 38 ins.

Paper Corp. of America ..... .16c
Walker, Goulard & Plehn Co. ..... .17c

No. 103—100,000 lbs., blue, No. 32; flat, cut 32x42 ins.

Paper Corp. of America ..... .1725c

Chemical Wood White Bond

No. 104—100,000 lbs., white, No. 40; flat, cut 32½x42½ ins., the grain to run lengthwise of the sheet.

Paper Corp. of America ..... .16c

25% Bond, White and Colored

No. 105—40,000 lbs., white, No. 20; flat, cut any size, min. width 21 ins., max. width 48 ins.

Howard Paper Mills, Aetna Division .2273c

No. 106—100,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.

Collins Mfg. Co. ..... .1899c
Howard Paper Mills, Aetna Division .1846c
Barton, Duer & Koch Paper Co. ..... .1965c
Central Ohio Paper Co. ..... .1965c

No. 107—100,000 lbs., No. 32 flat, cut any size, min. width 21 ins., max. width 48 ins.

Collins Mfg. Co. ..... .1899c
Howard Paper Mills, Aetna Division .1846c
Barton, Duer & Koch Paper Co. ..... .1965c

No. 109—200,000 lbs., No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.

Collins Mfg. Co. ..... .1799c
Howard Paper Mills, Aetna Division .1748c
R. P. Andrews Paper Co. (100,000 lbs. only) ..... .1865c
Cauthorne Paper Co. (100,000 lbs. only) ..... .1865c

No. 113—100,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.

Collins Mfg. Co. ..... .1965c
Howard Paper Mills, Aetna Division .1919c

No. 114—40,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.

Collins Mfg. Co. ..... .1865c
Howard Paper Mills, Aetna Division .1827c

100% White Bond

No. 128—35,000 lbs., white, Nos. 32 and 40; flat, cut any size, min. width 16 ins., max. width 38 ins., minimum order, one substance, 2,000 lbs.

R. P. Andrews Paper Co. (32 lbs.) .. .332c
R. P. Andrews Paper Co. (40 lbs.) .. .322c
Barton, Duer & Koch Paper Co. ..... .3185c

Chemical Wood White Ledger

No. 150—250,000 lbs., No. 48; flat, cut any size, min. width 17 ins., max. width 48 ins.

Paper Corp. of U. S. ..... .15c
Collins Mfg. Co. ..... .16c
Walker, Goulard & Plehn Paper Co. .165c

No. 151—40,000 lbs., No. 64; flat, cut any size, min. width 17 ins., max. width 48 ins.

Collins Mfg. Co. ..... .16c
Paper Corp. of America ..... .15c
Walker, Goulard & Plehn Paper Co. .165c

No. 153—100,000 lbs., white, No. 88; flat, cut any size, min. width 17 ins., max. width 48 ins.

Paper Corp. of America ..... .15c
Walker, Goulard & Plehn Paper Co. .165c

25% Ledger, White and Colored

No. 154—150,000 lbs., white, No. 48; flat, cut 28x34, 32x42, 34x44 and 38x48 ins. Min. order, one color, 5,000 lbs.

Collins Mfg. Co. ..... .1899c
Paper Corp. of U. S. ..... .192c
Howard Paper Mills, Aetna Division .1872c

No. 156—40,000 lbs., white, No. 88; flat, cut 28x34, 32x42, 34x44, and 38x48 ins. Min. order 5,000 lbs.

Collins Mfg. Co. ..... .1899c
Paper Corp. of U. S. ..... .192c
Howard Paper Mills, Aetna Division .1925c

No. 157—40,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 88; flat, cut 34x44 ins., min. order, one color, 5,000 lbs.

Collins Mfg. Co. ..... .1965c
Paper Corp. of U. S. (Min. 20,000 lbs. 1 color; 5,000 lbs. 1 size) ..... .199c
Howard Paper Mills, Aetna Division .1999c

100% White Ledger

No. 176—15,000 lbs., No. 48; flat, cut 28x34, 32x42, and 34x44 ins.; min. order 4,000 lbs.

R. P. Andrews Paper Co. ..... .3318c
Barton, Duer & Koch Paper Co. ..... .3285c
Paper Supply Co. ..... .3485c

No. 177—20,000 lbs., No. 64; flat, cut 28x34, 32x42, and 34x44 ins.; min. order 5,000 lbs.

R. P. Andrews Paper Co. ..... .3347c
Barton, Duer & Koch Paper Co. ..... .3285c
Paper Supply Co. ..... .3485c

Chemical Wood White and Colored Index

No. 183—100,000 lbs., white, 25½x30½—220 and 280; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one weight, 10,000 lbs.

Walker, Goulard & Plehn Co. (Carload lots) ..... .154c

50% Index, White and Colored

No. 189—350,000 lbs., white single-ply, tub-sized; 25½x30½—220 and 280; flat, cut 32x42, and 34x44 ins., with projecting colored-paper marker between each 100 sheets; min. order, one weight, 10,000 lbs.

Whitaker Paper Co. ..... .2238c
Paper Corp. of U. S. (100,000 lbs. only) ..... .209c
Walker, Goulard & Plehn Co. ..... .209c
Howard Paper Mills, Aetna Division .1893c
R. P. Andrews Paper Co. (50,000 lbs. sub. 220) ..... .1972c
R. P. Andrews Paper Co. (100,000 lbs. of either or both sub. 220 or 280) .215c
Barton, Duer & Koch Paper Co. ..... .1924c
Frank Parsons Paper Co. (100,000 lbs. only) ..... .2115c

No. 191—300,000 lbs., blue, buff, cherry, fawn, green, pink, salmon and yellow; 25½x30½—220 and 280; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one color, one weight, 5,000 lbs.

Paper Corp. of U. S. (Min. 20,000 lbs. 1 color; 5,000 lbs. 1 size, 100,000 lbs. only) ..... .216c
Walker, Goulard & Plehn Co. (5,000 lbs., 1 color) ..... .232c
Walker, Goulard & Plehn Co. (10,000 lbs. 1 color) ..... .225c
Walker, Goulard & Plehn Co. (15,000 lbs., 1 color) ..... .221c
Walker, Goulard & Plehn Co. (20,000 lbs, 1 color) ..... .218c
Walker, Goulard & Plehn Co. (30,000 lbs., 1 color) ..... .216c
Howard Paper Mills, Aetna Division .2168c
R. P. Andrews Paper Co. (50,000 lbs. sub. 220) ..... .2022c
Barton, Duer & Koch Paper Co. ..... .1982c

100% White Index

No. 196—40,000 lbs., Single-ply, Tub-sized, Air-dried; 25½x30½—250; flat, cut 20¼x30 ins.

R. P. Andrews Paper Co. ..... .3408c
Barton, Duer & Koch Paper Co. .... .3285c
Frank Parsons Paper Co. ..... .3485c
Old Dominion Paper Co. ..... .34768c

Coated Cover, White and Colored

No. 200—50,000 lbs., white; 20x26—130; flat, cut 26½x41, and 34x44 ins.; the grain to run lengthwise of the sheet; min. order 5,000 lbs.

Antique-Finish Cover, White and Colored

No. 202—30,000 lbs., white, 20x26—100; flat, cut 25¼x39 ins., with projecting colored-paper marker between each 500 sheets.

R. P. Andrews Paper Co. ..... .1172c

No. 203—30,000 lbs., 20x26—100; blue, buff, dawn, quaker drab, terra cotta, gray, brown, green, gobelin blue, granite, tea, and yellow; flat, cut 25¼x39 ins., with projecting colored-paper marker between each 500 sheets; min. order, one color, 5,000 lbs.

Whitaker Paper Co. ..... .1168c
R. P. Andrews Paper Co. ..... .1247c

50% Laid Cover, Colored

No. 206—70,000 lbs., blue, cream white, gray, and green; 20x26—130 and 200; flat, cut 25¼x39 and 28x41 ins. with projecting colored-paper marker between each 500 sheets; min. order, one color, 2,000 lbs.

Wilcox, Walter, Furlong ..... .213c
R. P. Andrews Paper Co. ..... .1968c

Wood Manila

No. 208—40,000 lbs., 24x36—80 and 100; flat, cut 25x38, 32x42 ins., with projecting colored-paper marker between each 500 sheets.

No. 209—80,000 lbs., 24x36—80 and 100; rolls, 21 ins. wide (3-inch fiber cores).

Chemical Wood Manila

No. 211—40,000 lbs., 24x36—140 and 160; flat, cut any size; min. order, one weight, 5,000 lbs.

No. 2 Kraft

No. 217—180,000 lbs., 24x36—80 to 160; flat, cut any size, in wrapped bundles.

No. 218—150,000 lbs., 34x36—80 to 160; cut any size, folded (25 sheets per fold), in wrapped bundles.

No. 219—100,000 lbs., 24x36—80 to 160; rolls, min. width 9 ins., max. width 48 ins., wound on wooden plugs, 1½ inch hole, or on 3-inch fiber cores as may be specified.

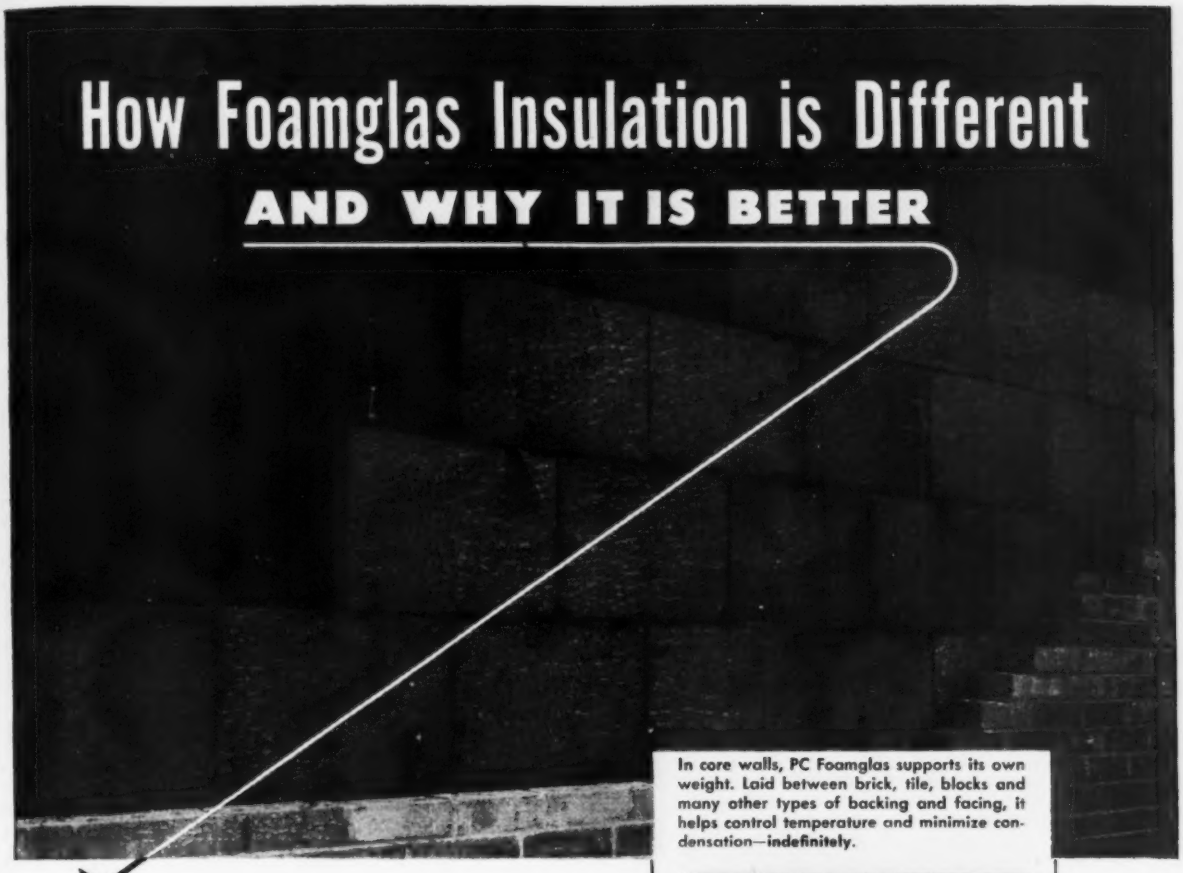
White Gummed

No. 252—300,000 sheets, No. 40; flat, cut 22x34 ins., min. order 25,000 sheets.

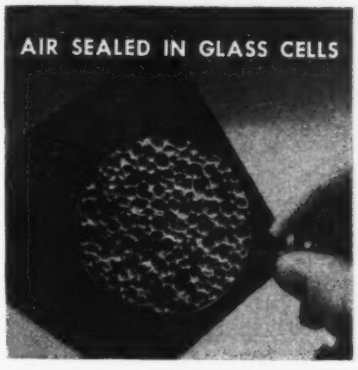
Barton, Duer & Koch Paper Co. (Price at time of shipment) $21.60
Stanford Paper Co. (Price at time of shipment) $20.60

How Foamglas Insulation is Different

AND WHY IT IS BETTER



In core walls, PC Foamglas supports its own weight. Laid between brick, tile, blocks and many other types of backing and facing, it helps control temperature and minimize condensation—**indefinitely.**



PC Foamglas is the only material of its kind. It is not a fiber, not a wool, not a board or a batt. It is literally a foam of glass, solidified into big, light-weight blocks, each composed of millions of minute air-filled glass cells. That is how it is *different* from other insulating materials.

Its unique cellular structure gives Foamglas excellent insulating properties. And since it is glass—and therefore impervious to many elements that usually damage or destroy other insulating materials — PC Foamglas retains its original insulating value *permanently*. That is why it is *better* than other insulating materials.

PC Foamglas has proved its ability to help maintain temperature levels, to minimize condensation, in structures of all kinds, without repairs or replacement due to failure of the material. First cost is last cost when you insulate with PC Foamglas — whether walls, floors, roofs or ceilings. When you insulate with Foamglas you insulate for good.

Why not send the coupon for complete information? Pittsburgh Corning Corporation also makes PC Glass Blocks.

WHEN YOU INSULATE WITH FOAMGLAS . . .

YOU INSULATE FOR GOOD!

FOR ADDITIONAL INFORMATION SEE OUR INSERTS IN SWEET'S CATALOGS.

PITTSBURGH PC CORNING

FOAMGLAS INSULATION

Pittsburgh Corning Corporation
Room 478, 632 Duquesne Way
Pittsburgh 22, Pa.

Please send me without obligation, your FREE booklets on the use of PC Foamglas insulation for:

Roofs..... Walls..... Floors.....

Name.....

Address.....

City..... State.....

High Finish Chemical Wood Manila Tag

No. 271—50,000 lbs., 24x36—280; flat, cut any size, min. width 24 ins., max. width 38 ins.

Paper Corp. of U. S. ..... .1311c

Jute Tag

No. 280—40,000 lbs., 22½x28½—200 and 280; flat, cut 34x44 ins., min. order, one weight, 10,000 lbs.

Paper Corp. of U. S. (200,000 lbs. basis price at time of shipment) .. .1725c
Paper Corp. of U. S. (280,000 lbs. basis price at time of shipment) .... .165c
R. P. Andrews Paper Co. ..... .1455c

Railroad Board, White and Colored

No. 303—20,000 lbs., white; flat, 22x34 ins., 14-ply, each 50 sheets fully banded; min. order 5,000 sheets.

Barton, Duer & Koch Paper Co. (Price at time of shipment) $98.05
Stanford Paper Co. (Price at time of shipment) $95.84
Old Dominion Paper Co. (Price at time of shipment) $95.778

No. 304—25,000 lbs., ash gray, green, orange, and red; flat, 22x34 ins., 4-ply, each 100 sheets fully banded; min. order, one color, 5,000 sheets.

Wood Cardboard, Colored

No. 306—100,000 lbs., buff, 22½x28½—150; rolls, 20 ins. wide (3-inch fiber cores).

No. 309—80,000 lbs., blue, buff, gray, green, melon, pink and yellow; 22½x28½—184; rolls, 20 inches wide (3-inch fiber cores).

Chemical Wood Tan Board

No. 310—90,000 lbs., 22½ x 28½—200; flat, cut 19½ x 28½, 25 x 38 and 34 x 44 ins.

Paper Corp. of U. S. (Price at time of shipment) ..... .1575c
R. P. Andrews Paper Co. ..... .1402c

United States Postal Card Paper

No. 325—1,500,000 lbs, 22½x28½—188; rolls, 33 ins. wide, 36 ins. diameter (6-inch iron or fiber cores).

Whitaker Paper Co. (Total 2,250,000 lbs., Lots 325, 326 & 327) ..... .0797c
R. P. Andrews Paper Co. (Total 2,000,000 lbs., Lots 325, 326 & 327) .0755c

No. 326—1,500,000 lbs., 22½x28½—188; rolls, 33 ins. wide, 36 ins. in diameter (6-inch iron or fiber cores).

Whitaker Paper Co. (Total 2,250,000 lbs., Lots 325, 326 & 327) ..... .0797c
R. P. Andrews Paper Co. (Total 2,000,000 lbs., Lots 325, 326 & 327) .0755c

No. 327—1,500,000 lbs., 22½x28½—188; rolls, 33 ins. wide, and 36 ins. in diameter (6-inch iron or fiber cores).

Whitaker Paper Co. (Total 2,250,000 lbs., Lots 325, 326 & 327) ..... .0797c
R. P. Andrews Paper Co. (Total 2,000,000 lbs., Lots 325, 326 & 327) .0755c

Newsboard

No. 360—100,000 lbs., 26x38—No. 100; flat, cut any size, min. 21x32 ins., max. 40x52½ ins. (To be trimmed square on four sides).

Paper Corp. of U. S. ..... .0518c
R. P. Andrews Paper Co. ..... .0525c

Binder's Board, No. 1 Quality

No. 366—50,000 lbs., hard-rolled flat, to trim 25x30 ins., Nos. 16, 18, 20, 25, 30, and 40.

Binder's Board, Best Quality

No. 368—10,000 lbs., hard-rolled flat, to trim 20x30 ins., and 22x28 ins., Nos. 18, 20, 25, 30, 35, 40 and 45. Min. order, 5,000 lbs.

Consolidated Paper Co. ..... .0824c

Chestnut Cover Board

No. 369—20,000 lbs., flat, to trim 25x30 ins., Nos. 17, 19, 21, 25, 31 and 41.

Mead Sales Co. ..... .056c

No. 370—200,000 lbs., flat, to trim 25¾x37¾ ins., Nos. 16, 19, 24 and 31.

Mead Sales Co. ..... .056c

Dorr Celebrates 30 Years At Westport Mill

WESTPORT, Conn. — The thirtieth anniversary of The Dorr Company's acquisition of the Westport mill, its research and testing plant, was celebrated on Saturday, September 6, at a birthday party at the plant, attended by some 250 members of the staff, their families and professional friends of the company. John V. N. Dorr acted as host and presided at the cutting of two huge birthday cakes.

The original mill, purchased in 1917, was a frame and shingle grist mill, built shortly after the Revolution. In 1937, after a fire, it was completely rebuilt as a modern laboratory. In 1944, a semi-works plant was added. Research and process engineering is done here for the company's own account and for its industrial clients.

Wood Products Opens Philadelphia Office

BREWER, Me.—Wood Products Company has opened a sales office under the management of J. Willard Heisley at Philadelphia.

The business was incorporated in 1920 and has been steadily manufacturing wooden plugs for paper rolls.

They manufacture wooden plugs in all sizes from 2 in. to 10 in. in diameter and have been servicing many of the leading paper mills in the United States and Canada.

All inquiries for plugs should be directed to the Sales Office, Wood Products Company, 1924 Chestnut Street, Philadelphia 3, Pennsylvania.

Texas Forest Service Leases 16 More Acres

COLLEGE STATION, Tex.—The Texas Forest Service, A. & M. College, has taken steps to expand its seedling production at Indian Mound forest tree nursery near Alto in Cherokee county. Sixteen additional acres adjacent to the present tract have been leased from Forest Grogan of Alto.

The new area, procured on a renewable annual lease for 10 years and option of purchase at that time, will be fenced and put into seedling production next spring. W. E. White, director of the Texas Forest Service, indicates it will provide an additional five to seven million seedlings each year and do much to meet the continued growing demands.

At present the Indian Mound Nursery is sorely taxed. This year seed for 16 million seedlings were planted. Two-thirds of these have already been spoken for and it is expected that the remainder will be ordered before tree shipment begins this winter.

The major portion of the pine seedlings are slated for use in East Texas to help reforest worn out crop land and denuded forest areas. A number of hardwood species are being grown for fence posts and windbreak plantings in other sections of the state.

This project is under the supervision of D. A. Anderson, chief of the division of silvicultural research, and Larry Marshman, acting chief of the Indian Mound nursery.

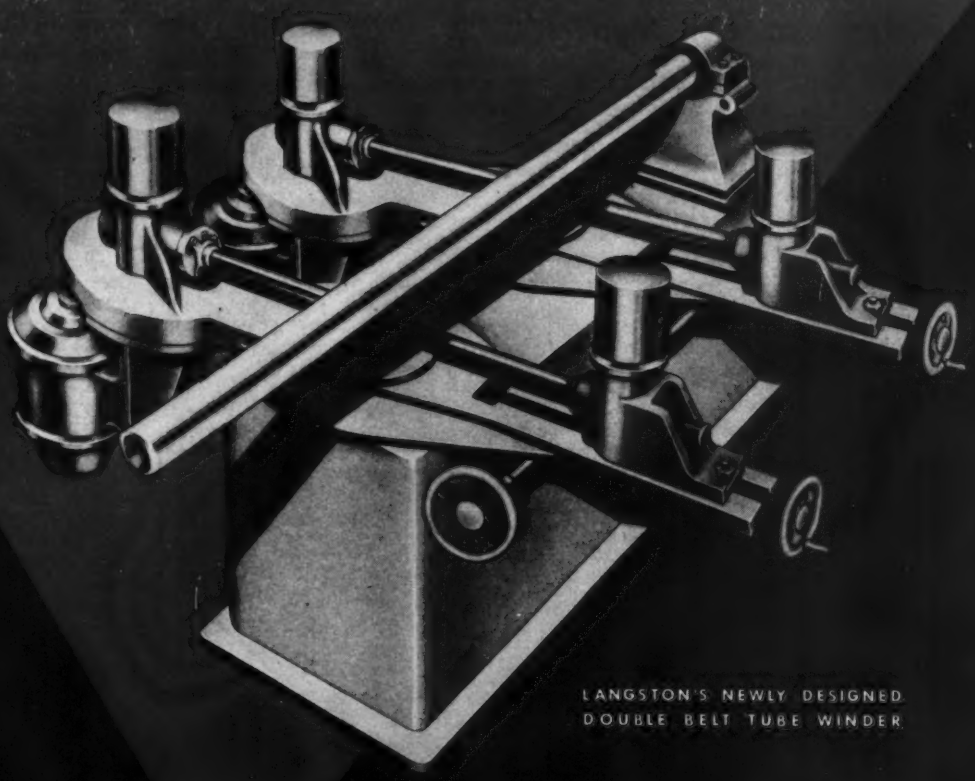
Polytechnic Course Opens September 24

BROOKLYN, N. Y.—The first lecture of the graduate course on Pulp and Paper Technology at the Polytechnic Institute of Brooklyn will be given on Wednesday night, September 24th, at the Institute at Borough Hall. The course is directed by Dr. Robert S. Aries, Consulting Engineer and Director of the Northeastern Wood Utilization Council with a panel of distinguished lecturers. It is open to qualified college graduates who are interested in acquiring a working knowledge of Pulp and Paper Technology.

Among the lecturers scheduled for October are R. G. Macdonald, Secretary of TAPPI, Vance Edwards of the International Paper Co., and Gerald Larocque of the New York Daily News.

Celanese Votes Dividends On Common and Preferred

NEW YORK — Directors of Celanese Corporation of America have declared a dividend of 40 cents per share on the common stock payable September 30, 1947, to stockholders of record September 16, 1947. At the same time the board also voted regular quarterly dividends for the current quarter of $1.18¾ per share on the first preferred stock $4.75 series and $1.75 per share on the 7 percent second preferred stock. Both these dividends are payable October 1, 1947, to stockholders of record September 16, 1947.



LANGSTON'S NEWLY DESIGNED
DOUBLE BELT TUBE WINDER

LANGSTON

TUBE WINDING EQUIPMENT

THIS NEW DESIGN NOW IN PRODUCTION MARKS FURTHER ADVANCES IN THE FLEXIBILITY, ACCURACY, DEPENDABILITY OF LANGSTON TUBE WINDING EQUIPMENT. BY OPERATING THE TWO BELTS AT DIFFERENT SPEEDS IT IS POSSIBLE TO SYNCHRONIZE SPEEDS WITH THE DIAMETER OF TUBE UNDER EACH BELT. (PATENT APPLIED FOR.) BOTH THE SINGLE AND DOUBLE BELT TUBE WINDERS HAVE A GREATER RANGE IN DIAMETER - FROM ¼" UP TO 13" - FOR HIGH SPEED MACHINES WHICH AUTOMATICALLY PRODUCE ACCURATELY CUT, CLEAN, UNIFORMLY WOUND TUBES. SPECIFY LANGSTON EQUIPMENT.

LANGSTON COMPANY, CAMDEN, NEW JERSEY

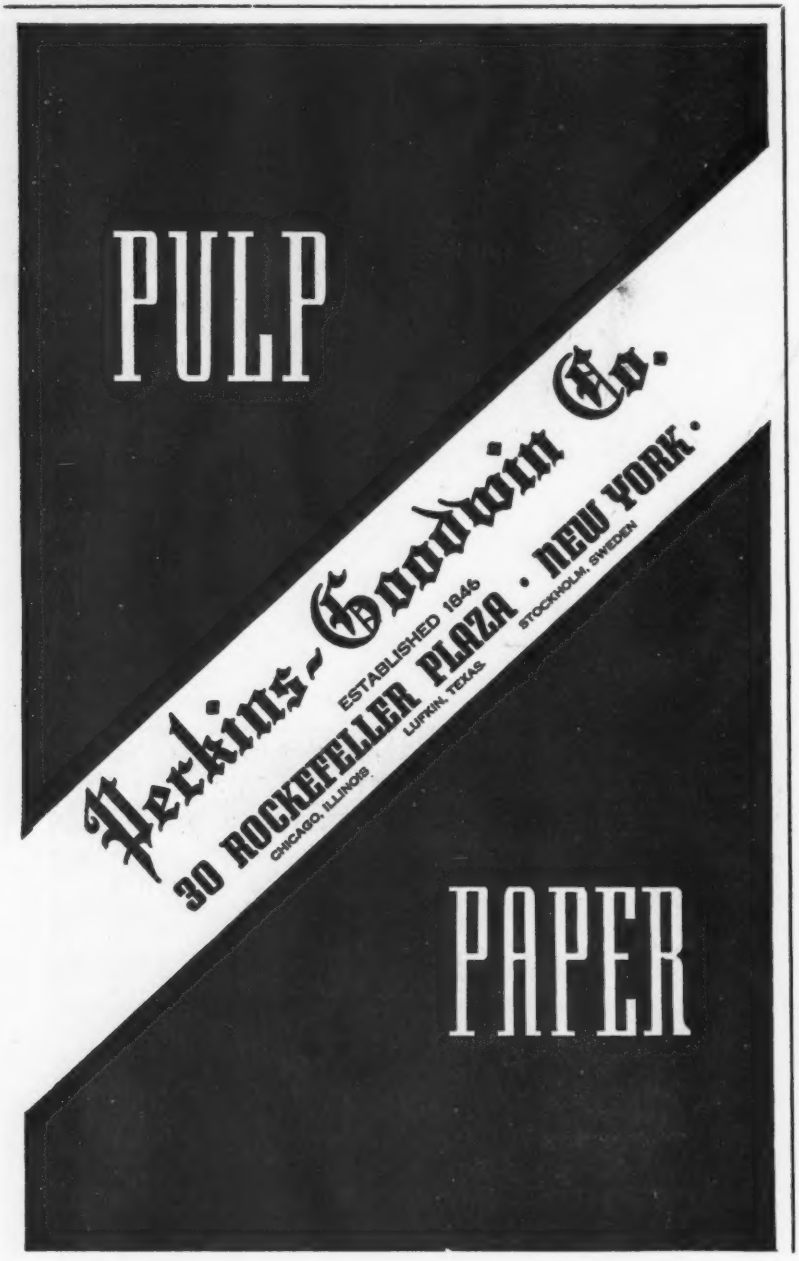
Kalamazoo Mill Men Start Fall Program

KALAMAZOO — The first fall meeting of the Michigan Division, American Pulp & Paper Mill Superintendents Association, will be held Thursday evening, September 18, 1947, at the Park-American Hotel. Dinner will be served at 6:30 p.m.

The Kodachrome movie with sound entitled "Machine Knives in Industry" will be shown by Harold Olson of Simonds Saw and Steel Company, Fitchburg, Mass. The Carborundum Company of Niagara Falls, New York, will show the film on "Higher Production and Greater Precision through Grinding." Discussion will follow both showings.

Walter F. Wolfe, past chairman, will be presented with his Recognition Award Certificate at this meeting.

The October meeting will be held at the Park-American on the 16th. Past Chairman Walter F. Wolf has arranged a program. Prof. James M. Apple, of Michigan State College, East Lansing, who is active in State Safety Council work will speak on "Fire Protection and Safety in Pulp and Paper Mills." Mrs. Jessie Kelley, chairman of the Industrial Nurses Section of the Michigan Nursing Center Association, will present a paper on "Evolution of the Graduate Registered Nurse in Industry."



Forestry College Publishes New Measuring Leaflet

SYRACUSE, N. Y.—A publication on scaling just revised by The New York State College of Forestry at Syracuse University is designed to aid all persons dealing with logs and lumber and others who for various reasons desire to know the number of board feet in logs and sawed lumber.

The publication contains 13 illustrations showing how to make allowance for defects such as crook, decayed core, ring shake, fire scar, and frost cracks.

Four tables of log measuring rules also appear in this leaflet. They are the tables used in New York State: The Doyle, the Scribner, the International, and the Glens Falls or Adirondack Standard. The Scribner rule is used to some extent in the southern tier counties, but throughout the State the Doyle rule is applied more than any other, according to the leaflet.

Another feature of the publication is a table showing the number of board feet in standard sizes of sawed lumber.

Copies of this leaflet are available without charge on request.

Florida's Newspapers Pledge Support for Proposed Mill

TALLAHASSEE — Possible establishment of a newsprint mill in Florida was advanced by State Forester C. Huxley Coulter at Tallahassee. He said Florida newspaper publishers have advised him they would sign long-term contracts for newsprint produced locally if a newsprint mill were built in the state.

The forestry committee of the Florida Bankers' Association urged establishment of such an industry in Florida.

Estimating 60 percent of America's newsprint comes from Canada, Coulter said a Florida mill could put out a high quality product at a lower labor cost and under less rigorous conditions than in the northern forests.

He emphasized that Florida pines replace themselves six times as fast as the trees used to manufacture Canadian newsprint.

Martinsburg Box Grants Increased Pay Scale

MARTINSBURG, W. Va. — The Martinsburg Paper Box Company has granted a wage increase ranging from 5 to 11 percent and affecting all employes of the local plant.

A union spokesman said the new wage scale, effective September 29, would average 80 cents an hour. The Martinsburg plant now employs 75 persons, but the number is usually up to 90 when operating at full capacity.

It is understood the new agreement also included provisions for hospitalization and sick benefits.

IT TAKES VERY LITTLE HEAT

It takes very little heat for the technician in the laboratory to evaporate the moisture from the sediment after his filter has become clogged. But it takes a lot of heat to dry a sheet of paper or board from a felt that has become clogged with fillers from the furnish.

Whippers, suction boxes and scrapers can remove only the surface deposits. Increasing the pressure at the couch forces these deposits deeper into the felt—seals the meshes tighter. Less water can pass through — more heat is needed at the driers — production goes down and costs go up.

When you encounter such conditions in your mill REMOVE THE FELT. Replace it with a Hamilton Felt with larger meshes that can't clog. Among the hundreds of Hamilton Felts there is always one that will solve your drying problem quickly and with a great saving of time and money.

• From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at lower cost.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

• Miami Woolen Mills •

Hamilton Felts

• Established 1858 •

IMPORTS

NEW YORK IMPORTS

WEEK ENDING SEPT. 13, 1947

SUMMARY

Newsprint	3225 rolls
Printing Paper	13 cs., 168 rolls
Filter Paper	18 cs.
Fancy Paper	1 bl.
Paper Napkins	8 cs.
Gummed Paper	24 cs.
Tissue Paper	5 cs.
Carbon Paper	3 cs.
Cigarette Paper	30 cs.
Tracing Cloth	33 cs.
Writing Paper	8 cs.
Miscellaneous Paper	1 cs.

NEWSPRINT

R. A. Olsen, Inc., Newscarrier, Donnacona, 392 rolls.

H. G. Craig Co., Donpaco, Donnacona, 369 rolls.

R. A. Olsen, Inc., G.T.D., Donnacona, 374 rolls.

H. G. Craig Co., Kermic, Donnacona, 356 rolls.

(———), Batory, Gdynia, 1734 rolls.

PRINTING PAPER

Oxford University Press, American Forwarder, Liverpool, 13 cs.

National City Bank, Norefjord, Stavanger, 168 rolls.

FILTER PAPER

Stevens Nelson Paper Corp., Fort Musquarro, London, 1 cs.

H. Reeve Angel & Co., Inc., Fort Musquarro, London, 17 cs.

FANCY PAPER

Keller Dorian Paper Corp., Mauretania, Southampton, 1 ble.

PAPER NAPKINS

(———), Mauretania, Southampton, 8 cs.

GUMMED PAPER

B. F. Drakenfeld & Co., American Forwarder, Liverpool, 24 cs.

TISSUE PAPER

B. F. Drakenfeld & Co., American Forwarder, Liverpool, 5 cs. (pottery).

CARBON PAPER

Mynol Chemical Co., American Forwarder, Liverpool, 3 cs.

CIGARETTE PAPER

F. P. Gaskell & Co., American Forwarder, Glasgow, 30 cs.

TRACING CLOTH

Keuffel & Esser Co., American Forwarder, Manchester, 33 cs. (cotton).

WRITING PAPER

The Lafayette Co., American Forwarder, Manchester, 8 cs.

MISCELLANEOUS PAPER

(———), St. Malo, Havre, 1 cs.

RAGS, BAGGINGS, ETC.

E. J. Keller Co., Inc., Czechoslovakia Victory, Antwerp, 105 bls. old bagging.

Continental Bank Trust Co., Bartlesville Victory, Alexandria, 80 bls. old bagging.

E. J. Keller Co., Inc., Bartlesville Victory, Alexandria, 170 bls. bagging.

New England Waste Co., Iraq Victory, Bombay, 500 bls. cotton waste.

Brandwein Mazur Co., Iraq Victory, Bombay, 150 bls. cotton waste.

Irving Trust Co., Iraq Victory, Alexandria, 417 bls. light hessian bagging.

Continental Bank Trust Co., Steel Scientist, Alexandria, 67 bls. hessian rags.

(———), Steel Scientist, Alexandria, 105 bls. old hessian bagging.

Manufacturers Trust Co., Meridian Victory, Genoa, 55 bls. old waste bagging.

(———), American Forwarder, Manchester, 83 bls. new cotton cuttings.

OLD HEMP ROPE CUTTINGS

(———), Exchange, Calcutta, 116 bls.

R. L. Pritchard, Exchange, Calcutta, 250 bls.

(———), Exchange, Calcutta, 516 bls.

Smith & Bird, Exchange, Calcutta, 260 bls.

(———), Cape San Diego, Calcutta, 430 bls.

(———), Trevider, Madras, 175 bls.

National City Bank, Trevider, Madras, 156 bls.

R. L. Pritchard, Trevider, Madras, 59 bls.

CASEIN

F. H. Paul & Stein Bros., Coastal Viking, Pt. au Prince, 24 bags.

GLUESTOCK

John Gorvers, Santa Sofia, Barranquilla, 63 bdls. dry hide cuttings.

Irving Trust Co., American Forwarder, Manchester, 127 bags hide cuttings.

BOSTON IMPORTS

WEEK ENDING SEPT. 13, 1947

S. H. Waldstein, Iraq Victory, Bombay, 200 bls. cotton waste.

PHILADELPHIA IMPORTS

WEEK ENDING SEPT. 13, 1947

Gottesman & Co., Inc., Gullmaren, 1524 bls. unbleached sulphite.

Heppenstall Enlarges Sales Department

PITTSBURGH—As a part of the general program for sales department expansion, John P. Roche, vice-president and general sales manager has appointed four new members to the sales personnel of Heppenstall Company.

David P. Williams is now representing the company in the Pittsburgh sales district. Mr. Williams, a graduate of Yale, was formerly vice-president of the Vulcan Mold & Iron Co., Latrobe, Pa.

Lawrence R. Malm also has been assigned a sales territory in the Pittsburgh district. Mr. Malm, a graduate of the Michigan College of Mines and Technology, was formerly general foreman of the cold strip finishing department at the Irvin Works, Carnegie-Illinois Steel Corp.

Transferred from the Heppenstall knife department at the Pittsburgh plant, W. H. Ritenbaugh is now a sales engineer. Mr. Ritenbaugh is now selling Heppenstall chipper knives to the paper and pulp industry. He is a graduate of the University of Pennsylvania.

E. V. Alderson, for the last three years chief accountant of Heppenstall Company, Pittsburgh, has been appointed statistician for the sales department in the Pittsburgh office. Mr. Alderson, a graduate of Pennsylvania State College, served during war years as secretary-treasurer of the former Heppenstall-Eddystone Corp.

SKF Issues New Bearing Catalog

PHILADELPHIA — How anti-friction bearings increase the rigidity and accuracy of machine tool spindles, many of which are being equipped with the spectacular carbide tools that permit greater speeds, feeds and depth of cut is explained by SKF Industries, Inc., in a new comprehensive 60-page catalog of machine tool bearings and spindle designs.

Bearing applications for turning and boring equipment and grinding machines are discussed in detail and include those for single and multiple spindle lathes, boring heads, milling machines, drill spindles and bore, O.D., surface, tool and special purpose grinders.

A section devoted to engineering principles relates cutting tool loads to bearing life and also deals with bearing seelction, load distribution, speed limitations, mounting and distribution. Other sections touch upon bearing tables and load data, for cylindrical roller, thrust ball and angular contact bearings, tolerance tables and shaft housing dimensions.

A description of the oil mist lubricator developed by SKF and designed to lengthen the life of spindle bearings from several hundred to as much as several thousand hours is contained in the catalog which is illustrated with numerous charts and diagrams.

A MUST on tapered pulleys:

FLEXOCONE
(PATENTED)

The peculiar stresses of cone pulley operation place an almost insuperable burden on ordinary belting. FLEXOCONE, a patented leather belt, is scientifically constructed to compensate for these strains. Its flexible patented construction is able to adjust to the diagonal pull of the opposing tapers so that full traction of the belt is realized, thus delivering maximum power.

FLEXOCONE's special 3-ply construction insures that the line of greatest resistance will be applied to the line of greatest stress. This feature prevents slipping and stretching, reduces maintenance costs, results in longer belt life thereby lowering belting cost per ton of paper produced.

May our experienced engineers design belts for your particular drives? Send for Specification Sheets —remember, consultation incurs no obligation.

A close-up view of FLEXOCONE operating from line shaft in an Eastern paper mill

ALEXANDER BROTHERS
406 N. Third Street, Philadelphia 23, Pa.

BRANCH OFFICES
CHARLOTTE · CHICAGO · DALLAS · NEW YORK

TRENDS

Office of PAPER TRADE JOURNAL,
Wednesday, September 17, 1947.

Paper, paperboard and pulp supplies are steadily closing the gap between demand and consumption. However, the supply-demand balance is not expected to take place until the first quarter of 1948 when additional pulp, paper and board capacity coming into operation will begin to be felt. Industry leaders are not concerned over a possible recession once supplies catch up with demand. They point a forward looking finger at a substantial foreign demand which could be met by domestic mills if export interest is aroused. Another increasingly fertile field looms in the textbook industry. Schoolbook publishers are already profiting from record wartime birthrates. That they need more text paper than ever before is readily understandable when we realize the textbook industry has developed from a $50,000,000 annual business in prewar years to well over a $100,000,000 volume today. Further, trade sources say this is only the beginning with publishers certain they can count on large birth rates to continue for at least another six years, bringing with it an increasing need for books moving through primary, elementary, high school and college classes. Added to this, where the present-day adult had one primer, the 1947 first-grader has a pre-reader, a pre-primer and a couple of primers. Social study books and texts on mental and physical health are swelling the publishers' sales. Science is being taught to first graders so they won't miss out on wonders like the atom bomb. All this calls for plenty of paper to keep pace with a growing American book industry.

The index of general business activity for the week ended September 6 declined to 140.8 from 143.2 in the preceding week, compared with 132.8 for the corresponding week in 1946. The index of paperboard production declined to 162.7 from 168.1 in the preceding week, compared with 160.7 for the corresponding week in 1946.

Paper production for the week ended September 6 was estimated at 84.7 percent, compared with 104.1 for the preceding week, with 86.7 for the corresponding week in 1946, with 75.9 for 1945, with 74.4 for 1944, and with 74.6 percent for the corresponding week in 1943.

Paperboard production for the week ended September 6 was 79.0 percent of capacity, compared with 99.0 percent for the preceding week, with 83.0 for the corresponding week in 1946, with 80.0 for 1945, with 80.0 for 1944, and with 83.0 percent for the corresponding week in 1943.

Industry analyses indicate a substantial disparity for the current and coming years between the demand for wood pulp on the part of mills purchasing all or most of their requirements and the quantity of pulp available for purchase now and in the foreseeable future. The chief sources of market pulp supply are, of course, the United States, Canada, and Northern Europe, with some prospect of limited supplies forthcoming from Russia and Mexico. In the three major pulp-producing areas, there appears, according to the industry observers, to be considerable doubt that any appreciable portion of the supply disparity will be made up. . . . In the United States, they indicate the production of market pulp has recently been on the downgrade, and the contemplated expansion of the paper and pulp industry insofar as domestic market pulp is concerned is practically limited to integrated operations. Apart from the relatively small quantity of new capacity, there is the possibility that some present producers of bleached sulphite market pulp may divert increasing amounts of their output to rayon and other special nonpaper grades. The present regular supply of domestic market bleached sulphite is confined to a few independent producers, while market supplies of sulphate pulp, both bleached and unbleached, consist entirely of the surplus production of integrated mills.

Jacksonville, Fla., has been placed on a regular schedule to receive newsprint direct from Scandinavia. For the last two months, 750 tons of newsprint have been received each month. That schedule is expected to be continued for the present. . . . The Gadsden Times claims to be the first newspaper in the world to paste three narrow-width sheets together to form a standard-width sheet of newsprint. The operation will provide 32 additional columns per paper daily and can provide 64 additional columns on editions of two sections as on Thursdays and Sundays. These 12-inch rolls are too narrow to run on individual newspaper presses. They are left-over ends after the newsprint has been cut at the paper manufacturing plants. The three rolls of paper are placed on the spindles of a built up addition attached to the framework of the press which has two pasters at the front end, containing glue. The glue is picked up by two rubber wheels which roll it onto the edges of the center sheet. The three sheets pass over the top spindle, causing the inside edges of the two outside rolls to adhere to the outside edges of the center sheet thus forming the standard 34½ inch wide page. From there, the standard width page enters the press. The publishers expect to use this machine about two years, at which time they believe the newsprint shortage will end.

Wood Pulp

Finnish wood pulp prices have been upped again with the leading grades quoted as follows: Bleached sulphite $179.95 per short ADT ex. dock New York. Unbleached sulphite $140.75; unbleached sulphite (special grade) $145.75; unbleached sulphate $140.45; unbleached sulphate (special grade) $168.54.

Domestic wood pulp prices remain firm with groundwood $75 to $80 per short ADT delivered; unbleached sulphite $115 to $117; bleached sulphite $121 to $125; bleached soda $115 to $120; unbleached kraft $112.50 to $120, and Southern kraft $90 to $102.50.

Rags

Paper mill demand for top grade rags continues steady with white shirts at $11.50 to $12 leading the list of new domestic cotton cuttings. Light Silesias at $7.50 remain strong. Washables at around $4 are finding quite an active market. Cottonades are $5 to $5.50. Bleachable khaki $6 to $6.50. Blue overalls are $7.75 and white back blue overalls are taken up at $8.50.

In the old domestic cotton rag market roofing rags are being taken up at prices below those quoted a few weeks ago. No. 1 roofing rags are now $1.65 per 100 pounds f.o.b. shipping point, plus dealer's commission. No. 2 roofing rags are $1.55; No. 3 jute bagging $1.45; with No. 4 Brussels and hard back carpets and No. 5A roofing rags going at the $1.45 level.

Old Rope and Bagging

Market for old rope continues steady with domestic Manila rope close to $5.75 per 100 pounds f.o.b. to mills New York. Foreign Manila is taken up at $6 with the good grades going as high as $7. Jute strings remain $4.50 to $5; No. 1 sisal strings $5.50 to $6 and mixed strings $1.75 to $2.50.

Bagging continues firm with foreign gunny No. 1 taken up at $4.75 to $5; while domestic No. 1 gunny stays at $4.25 to $4.50. Light wool tares are $4.50 to $4.75 and heavy wool tares $4.75 to $5. Bright bagging is active at $4.25 to $4.50.

Waste Paper

Paper mill activity for waste paper continues strong enough to warrant quotations reaching new contract levels. Leading the list of new high waste paper prices are No. 1 hard white envelope cuts, one cut, at $135 per ton to mills f.o.b. baled New York. No. 1 hard white envelope cuts are $120. Soft white shavings, one cut, are $120. Triple sorted, No. 1 brown soft kraft is taken up at $65 to $75. New 100 percent kraft corrugated cuttings are $75 to $80 and white blank news $75 to $80.

PRICES

With the elimination of price controls on paper, pulp, rags and other materials, the quotations given below once more become indicative of trends in an open market. At the moment they can be of little more, for, while some volume business still is being done under contract at the figures given below, fluctuations representing special conditions are too varied and too frequent to permit prices to be given as representing a wholly stabilized market.

Paper

(Delivered New York)

Standard News, per ton—
Roll, contract ....$87.50 to $90.00
Sheets .....$109.00 " —

Kraft—per cwt.—Carload Quantities

Zone A, Delivered
40 lb. base weight

Superstandard Wrapping	$7.00	to	—
No. 1 Wrapping	6.50	"	6.75
Standard Wrapping	6.00	"	6.25
Standard Bag	5.75	"	6.25

Tissues—Per Ream 24x36 (480) 10 lb. Zone 1.

Wh. No. 1 Frd.	$1.65	to	$1.72
Wh. No. 1 M. G.	1.65	"	1.72
Wh. No. 1½	1.48	"	—
Wh. No. 2	1.55	"	—
Kraft Anti-Tar	1.38½	"	—
Kraft Unbl.	1.85	"	—
Manila No. 2	1.62	"	—

Toilet—Per Case of 100 rolls—1 M Sheets.

Unbleached	$5.50	to	$6.40
Bleached	6.50	"	7.60

Paper Towels—Per Case of 3750—Zone 1.

Wh. Jr. M'tif'd 9¼x9½	$4.85
Br. Sr. M'tif'd 10x12	3.45
Br. Jr. M'tif'd 9½x9¾	2.95
Br. Jr. Sgl. fold 10x10¾	3.10

Manila—per cwt.—C. l. f. a.

No. 1 Jute Tag	$13.80
Reg. Jute Manila	13.25
No. 1 Manila	9.75

Boards, per ton—

News	$92.50	"	—
Chip	90.00	"	—
Sgl. Mn. L1 Chip*	102.50	"	—
White Pat. Coated*	120.00	"	—
Kraft Liners 42 lb.	95.00	"	—
Binders Boards	126.00	"	—

* Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following prices are representative of distributors' resale prices, all deliveries in Zone 1: Rag Content Bonds and Ledgers—

White, Assorted Items
Bonds, per cwt.

	Carton 4 C't'n	Ton
100% Rag Ext. No. 1	$55.00	$48.00
100% Rag	46.50	41.25
75% Rag	35.00	31.50
50% Rag	31.50	27.50
25% Rag	28.00	24.50

Ledgers, per cwt.

100% Rag Ext. No. 1	$54.25	$50.00	$48.00
100% Rag	46.25	42.50	40.75
75% Rag	36.00	33.25	31.75
50% Rag	31.00	28.00	27.00
25% Rag	27.25	24.75	23.75

Sulphite Bonds and Ledgers—
White, Assorted Items
Bonds, per cwt.

No. 1	$19.25	$17.50	$16.80
No. 2	18.25	16.50	16.00
No. 4	16.75	15.25	14.50

Ledgers, per cwt.

No. 1	$20.25	$18.35	$18.60
No. 2	19.25	17.50	16.80
No. 4	17.75	16.25	15.50

Free Sheet Book Papers—
White, Cased Paper

(Per cwt.)	Case	Ton
No. 1 Glossy Coated	$19.40	$18.60
No. 2 Glossy Coated	18.15	17.35
No. 3 Glossy Coated	17.65	17.00
No. 1 Antique (Water marked)	$15.90	$15.25
No. 2 Offset	16.00	14.75
A Grade E. F.	13.90	13.30
A Grade S. & S. C.	14.40	13.70
B Grade E. F.	Nominal	
B Grade S. C.	Nominal	
C Grade E. F.	Nominal	
C Grade S. C.	Nominal	
D Grade E. F.	Nominal	
D Grade S. & S. C.	Nominal	

Wood Pulp

Domestic mill prices delivered with former OPA freight allowances.

	Per Short ADT
Groundwood	$75.00 to $80.00
Unbleached Sulphite	115.00 " 117.00
Bleached Sulphite	121.00 " 125.00
Bleached Soda	115.00 " 120.00
Unbleached Kraft	112.50 " 120.00
Southern Kraft	90.00 " 102.50

Canadian mill Prices delivered with freight allowances unless otherwise specified:

	Per Short ADT
Select Unbleached Kraft (no freight allowance)	115.00 " —
Unbleached Sulphite	115.00 " 117.00
Bleached Sulphite	125.00 " 155.00
Glassine Unbleached Sulphite (no freight allowance)	112.00 " —
Bleached Soda	105.00 " 115.00
Groundwood	75.00 " 80.00
Sideruns Pulping News	75.00 " 80.00
Hardwood and Specialty Grades	Nominal

Swedish Quotations
Ex. dock, New York

	Per Short ADT
Bleached Kraft	$150.00 to 156.00
Bleached Sulphite	151.00 " 158.50
Unbleached Sulphite	121.00 " 131.00
Unbleached Kraft	116.00 " 126.00

Finnish Quotations
Ex. dock, New York

	Per Short ADT
Bleached Sulphite	$179.95
Unbleached Sulphite	140.45
Unbleached Sulphite (special grade)	145.75
Unbleached Sulphate	140.45
Unbleached Sulphate (special grade)	168.54

New Domestic Cotton Cuttings

(Prices delivered Mill Plus Dealer's Commission)

White Shirt	$11.50	to	$12.00
Light Silesias	7.50		
Unbleached Muslin	11.50	"	12.00
White Back Blue Overalls	8.50		
Blue Overalls	7.75		
Unbl. Fancy Shirt	5.00	"	5.50
Light Percales	6.00	"	6.50
Light Prints	5.25	"	5.95
Washables	4.00		
Bleachable Khaki	6.00	"	6.50
Unbleachable Khaki	5.50	"	6.00
Cottonades	5.00	"	5.50

Old Domestic Cotton Rags

(F.O.B. Shipping Point Plus Dealer's Commission)

	Per 100 lbs.
No. 1 Whites Repacked	$4.50
No. 1 Whites Miscellaneous	4.25
No. 2 Whites Repacked	4.00
No. 2 Whites Miscellaneous	3.50
Blue Overalls	3.75
Thirds and Blues Repacked	3.00
Thirds and Blues Miscellaneous	2.50
No. 1 Roofing Rags	1.65
No. 2 Roofing Rags	1.55
No. 3 Jute Bagging	1.45
No. 4 Brussels and hard back carpets	1.45
No. 5A Roofing Rags	1.45

New Foreign Cotton Cuttings

(Prices delivered Mill)

	Per 100 lbs.
New Dark Cuttings	$6.00 to —
New Mixed Cuttings	6.50 " —
Light Silesias	9.00 " 10.00
Light Flannelettes	8.00 " 9.00
New White Cuttings	13.00 " 15.00
Fancy Shirt Cuttings	9.00 " 10.00
Light Prints	8.00 " 10.00
Bleachable Khaki, No. 1	7.00 " 7.50
Unbl. Khaki, No. 1	6.25 " 6.75

Old Foreign Rags

(F.O.B. New York)

	Per 100 lbs.
No. 1 White Linens	$14.00 to 16.00
No. 2 White Linens	12.00 " 13.00
No. 3 White Linens	8.00 " 9.00
No. 4 White Linens	8.00 " 9.00
No. 1 White Cottons	10.00 " 12.00
No. 2 White Cottons	8.00 " 9.00
No. 3 White Cottons	6.50 " 7.00
No. 4 White Cottons	5.00 " 5.50
Extra Light Prints	7.50 " 8.00
No. 1 New Light Prints	6.25 " 6.75
Med. Light Prints	5.25 " 5.75
Dutch Blue Cottons	5.25 " 5.50
Checks and Blues	4.00 " 4.25
Linsey Garments	3.00 " 3.75
Dark Cottons	2.50 " 3.00
Old Shopperies	2.50 " 3.00
New Shopperies	2.50 " 3.00

Bagging

(Prices to Mill, f.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny, No. 1	$4.75 to 5.00
Domestic Gunny, No. 1	4.25 " 4.50
Light Wool Tares	4.50 " 4.75
Heavy Wool Tares	4.75 " 5.00
Bright Bagging	4.25 " 4.50
Foreign Manila Rope	6.00 " 7.00
Domestic Manila Rope	5.75 " 6.50
Jute Strings	4.50 " 5.00
No. 1 Sisal Strings	5.50 " 6.00
Mixed Strings	1.75 " 2.50

Waste Paper

Prices to Mills
(Dollars Per Ton)
F.o.b. New York, Baled

No. 1 Hard White Envelope Cuts, one cut	$125.00 to $135.00
No. 1 Hard White Envelope Cuts	110.00 " 120.00
No. 1 Hard White Shavings, unruled	110.00 " 120.00
No. 1 Hard White Shavings, ruled	100.00 " 120.00
Soft White Shavings, one cut	110.00 " 120.00
No. 1 Soft White Shavings	90.00 " 100.00
Soft White Shavings, Misc.	80.00 " 90.00
No. 1 Fly Leaf Shavings	55.00 " 60.00
No. 2 Fly Leaf Shavings	50.00 " 55.00
No. 1 Groundwood Fly Leaf Shavings	30.00 " 33.00
No. 2 Mixed Groundwood Fly Leaf Shavings	(nominal)
Mixed Colored Shavings	(nominal)
Mixed Groundwood Colored Shavings	(nominal)
Overissue Magazines	(nominal)
No. 1 Heavy Books & Magazines	25.00 " 30.00
Mixed Books	15.00 " 20.00
No. 1 White Ledger	75.00 " 85.00
New Manila Envelope Cuttings, one cut	100.00 " 110.00
New Manila Envelope Cuttings	65.00 " 75.00
Extra Manilas	35.00 " 40.00
Mixed Kraft, Env. & Bag Cuttings	75.00 " 85.00
Kraft Envelope Cuttings	100.00 " 105.00
Triple Sorted, No. 1 Brown Soft Kraft	65.00 " 75.00
New 100% Kraft Corrugated Cuttings	75.00 " 85.00
No. 1 Assorted Old Kraft	40.00 " 50.00
New Jute Corrugated Cuttings	27.00 " —
Old 100% Kraft Corrugated Containers	(nominal)
No. 1 News	17.00 " 19.00
No. 1 Mixed Paper	15.00 " 17.00
Box Board Cuttings	16.00 " —
White Blank News	75.00 " 80.00
Overissue News	(nominal)
Old Corrugated	30.00 " 32.00
Mill Wrappers	22.00 " 25.00

Twines

All Prices Nominal
(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—India	.26	to	.29
Fine Polished—Fine India	.31	"	.35
Unpolished—Paper Makers	.20	"	.26
Tube Rope	.22	"	.27½
Wrapping	.26	"	.33½
Cotton	.70	"	—

(Hard Fiber)

Mex. Sisal	.21	"	.24
Manila	.33	"	—

(Hemp)

Polished Hemp	.63	"	—

PHILADELPHIA

Domestic Rags (New)

(F.O.B. Eastern Shipping Point)

Shirt Cuttings— New White No. 1	.10½	to	.11
New White No. 2	nominal		
Light Silesias	.07½	"	.08
Black Silesias, soft	.06½	"	.07
New Unbleached	.10½	"	.11¼
Washable Prints	.06½	"	.07
Washable No. 1	.05	"	.05½
Blue Overall	.07½	"	.08
Cottons—According to grades— Washable Shredding	.03½	"	.04
Fancy Percales	.06¼	"	.07¼
New Black Soft	nominal		
Khaki Cuttings— Unbleachable Cotton Cuttings	.06	"	.06½
Bleachable Cotton Cuttings	.07	"	.07½
Men's Corduroy	.05½	"	.06
Ladies' Corduroy	.05	"	.05½
Cottonades	.05½	"	.06

Domestic Rags (Old)

(F.O.B. Eastern Shipping Point)

White No. 1—Repacked	4.50	to	5.00
Mixed White	4.00	"	4.25
White No. 2—Repacked	3.50	"	3.75
Thirds and Blues— Miscellaneous	2.25	"	2.50
Repacked	2.75	"	3.00
Roofing Stock— Foreign No. 1	nominal		
Domestic No. 1	1.70	"	1.75
Domestic No. 2	1.60	"	1.65
Roofing Bagging	1.50	"	1.65
Old Manila Rope	6.50	"	6.50

Bagging

(F.O.B. Eastern Shipping Point)

Gunny No. 1— Foreign	nominal		
Domestic	4.50	to	5.00
No. 1 Clean Bright— Sisal Strings	.04	"	.04½
No. 2 Clean Bright— Sisal Strings	.03	"	.03½
Sisal Jute	.02¾	"	.03
Scrap— No. 1	4.00	"	4.50
No. 2	1.75	"	2.00

Wool Tares, heavy	4.75	"	5.00
New Burlap Cuttings	6.00	"	6.50

Old Papers

(F. o. b. Phila.)
Mill Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00	to	$115.00
No. 1 Hard White Shavings, unruled	100.00	"	—
Soft White Shavings, one cut	90.00	"	95.00
White Blank News	60.00	"	65.00
Soft White Shavings	80.00	"	—
No. 1 White Ledger	80.00	"	85.00
Ledger, Colored	67.00	"	70.00
No. 1 Heavy Books & Magazines	30.00	"	32.00
Overissue Magazines	nominal		
New Manila Envelope Cuttings	80.00	"	—
No. 1 Assorted Old Kraft	60.00	"	65.00
No. 1 Mixed Paper	15.50	"	—
Box Board Cuttings	15.00	"	—
Kraft Corrugated Cuttings	100.00	"	—
Old Corrugated	30.00	"	35.00
Overissue News	30.00	"	—
No. 1 News	18.00	"	20.00

BOSTON

Old Papers

(F. o. b. Boston)
Mill Prices, Baled

No. 1 Hard White Shavings, unruled	7.00	to	8.00
No. 1 Hard White Shavings, ruled	7.00	"	8.00
Soft White Shavings, Misc.	6.25	"	6.50
No. 1 Fly Leaf Shavings	1.65	"	1.80
No. 2 Fly Leaf Shavings	2.00	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	1.25	"	1.50
Mixed Colored Shavings	2.50	"	2.75
New Manila Envelope Cuts, one cut	5.00	"	5.50
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	3.50	"	3.75
Mixed Kraft Env. & Bag Cuttings	3.75	"	4.00
Kraft Envelope Cuttings	3.75	"	4.00
No. 1 Heavy Books & Magazines	2.50	"	2.60
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	4.25	"	4.50
Groundwood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	3.50	"	—
No. 1 Mixed Paper	—	"	.95
Overissue News	1.50	"	1.75
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.50	"	—
Jute Corrugated Cuttings	1.07½	"	—
Paper Strings	2.25	"	2.50

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	—	to	4.75
Domestic	—	"	4.75
Sisal Rope No. 1	6.00	"	—
Sisal Rope No. 2	5.50	"	—
Mixed Rope	5.25	"	—
Mixed Strings	2.00	"	2.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	3.00	"	3.50
Manila Rope—			
Foreign	(nominal)		
Domestic	6.25	"	—
Soft Jute Rope	5.00	"	5.25
Jute Carpet Threads	6.00	"	—
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	—	"	4.75
Domestic	—	"	4.87½
South America	5.25	"	—
Wool Tares—			
Foreign	4.75	"	—
Domestic	4.75	"	—
Aust. Wool Pouches	5.00	"	5.25
New Zealand Wool Pouches	5.25	"	5.50
New Burlap Cuttings	6.00	"	6.50
Heavy Baling Bagging	5.25	"	5.75
Paper Mill Bagging	3.50	"	3.75
No. 1 Roofing Bagging	1.75	"	—

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.08	to	—
Fancy Percales	.07½	"	.08
New White No. 1	.11	"	.11½
New Light Flannelettes	.08	"	.08½
Canton Flannels, Bleached	.10	"	.11
Underwear Cutters, Bleached	.10	"	.11
Underwear Cutters, Unbleached	.11	"	.12
Silesias No. 1	.08	"	.08½
New Black Silesias	.05	"	—
Red Cotton Cuttings	.05	"	—
Blue Overalls	.08½	"	.09
Soft Unbleached	.11	"	.12
Blue Cheviots	.08½	"	.09
Fancy	.06	"	—
Washable	.06	"	—
Khaki Cuttings	.06½	"	.07¼
Corduroy	.03½	"	—
Khaki Canvas	.06¼	"	.06½
B. V. D. Cuttings	.10½	"	.11¼

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	to	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	2.00	"	—
No. 2	1.75	"	2.00
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
Old Manila Rope	6.00	"	—

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)
Mill Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	$110.00	to	$120.00
No. 1 Hard White Shavings, unruled	105.00	"	115.00
No. 1 Soft White Shavings	80.00	"	95.00
No. 1 White Ledger	55.00	"	65.00
No. 1 Heavy Books & Magazines	40.00	"	43.00
White Blank News	43.00	"	49.00
Mixed Kraft Env. & Bag Cuttings	75.00	"	85.00
No. 1 Assorted Old Kraft	45.00	"	55.00
Overissue News	28.00	"	—
No. 1 News	18.00	"	—
No. 1 Mixed Paper	12.00	"	—
Old Corrugated	30.00	"	—
Mill Wrappers	22.00	"	—

MARKETS

BLANC FIXE—Demand steady, supplies adequate deliveries fair. Pulp is currently quoted at $55 per ton, in barrels, car lots, at works; and $60 less car lot same basis.

BLEACHING POWDER—Supplies continue tight although demand has eased up. Shipments improved. Quotations are unchanged. Prices on bleaching powder range from $3 to $3.75 per 100 pounds.

CASEIN — Current prices on processed acid percipitated casein are quoted around 24 to 26 cents per pound for domestic grades and 28 to 32 cents for imported grades f.o.b. shipping point.

CAUSTIC SODA—Market remains tight, some improvement noted in shipments. Solid caustic soda is reported at $2.85 per 100 pounds; flaked and ground offered at $2.25 to $3.25 per 100 pounds, car lots, at works.

CHINA CLAY—Demand steady, domestic grades in good supply. Domestic filler clay is currently $9 to $11 per ton, car lots. Coating clay is currently $15 to $30 car lots. Imported clay is currently quoted at from $18 to $35 per ton, in car lots, export warehouse.

CHLORINE — Market tight as demand continues strong. Lack of tank cars continues to hamper deliveries. Quantities unchanged. Chlorine is currently quoted at $2.25 to $3.75 per 100 pounds.

ROSIN — Gum rosin in drums per 100 pounds, net, in yard New York, car lots, B, D, E, $8.25; F, G, H, I, $8.50; K, M, N, WG, & WW, $8.55. Wood rosin, per 100 pounds net, f.o.b., l.c.l. N. Y., B, $6.45; FF, $7.95; G, H, I, K, M, $8.28; N, $8.33; WG & WW, $8.45; X, $8.55.

SALT CAKE—Demand continues strong with slight improvement in shipments. Prices remain unchanged. Domestic salt cake is quoted at $20 to $26 per ton in bulk.

SODA ASH—Demand active with no improvement in the supply situation, previous orders filled. Contract orders prevail at the same high levels. Current prices, car lots, per 100 pounds, are as follows: in bulk, $1.10; in paper bags, $1.30; and in barrels, $1.70.

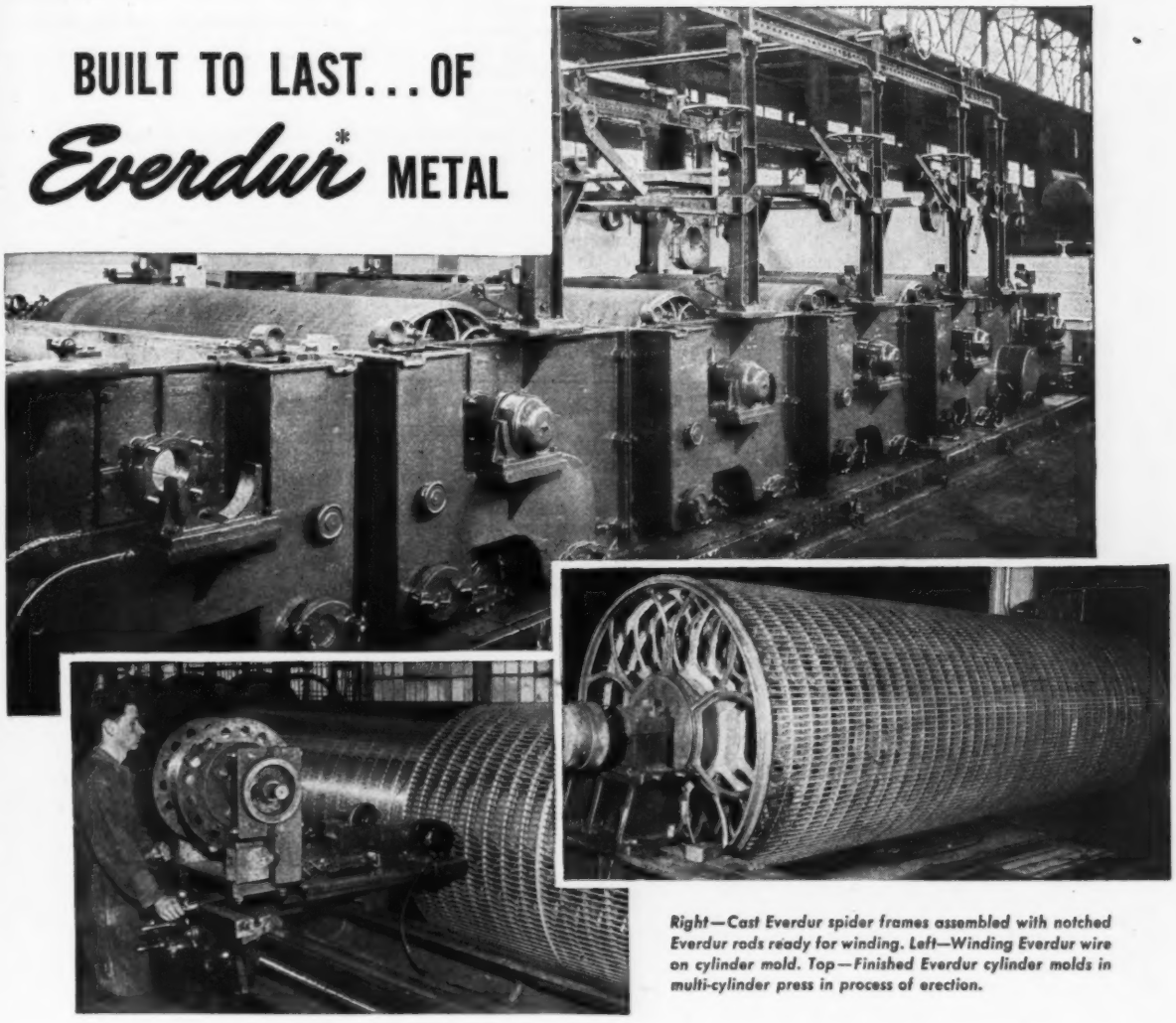
STARCH—Capacity production absorbed by active demand, export demand eased up. Starch prices continue strong with the pearl grade quoted at $6.37 per 100 pounds; powdered starch at $6.48 per 100 pounds, car lots, Chicago.

SULPHATE OF ALUMINA — Active demand covered by fair supplies. Quotations continue unchanged. The commercial grades are quoted at from $1.15 to $1.30 per 100 pounds, in bags, car lots, f.o.b. works. Iron free is quoted at $1.95 to $2.25 per 100 pounds in bags at works.

SULPHUR — Supplies ample to meet increasing demand. Annual contracts are quoted at $18 per long ton, f.o.b. mines; the price f.o.b. at Gulf Ports is $19.50 per long ton.

TALC—Domestic and French markets have eased up, prices remain steady. Domestic grades are currently quoted at from $16 to $30 per ton in mines; Canadian at $35 to $45 per ton. All prices in car lots.

BUILT TO LAST... OF *Everdur** METAL



Right—Cast Everdur spider frames assembled with notched Everdur rods ready for winding. Left—Winding Everdur wire on cylinder mold. Top—Finished Everdur cylinder molds in multi-cylinder press in process of erection.

CYLINDER MOLDS for the paper board machine in course of assembly above, are fabricated completely from Everdur* Copper-Silicon Alloys by The Bagley and Sewall Company of Watertown, New York.

Spider frames are cast of Everdur and tied together with ⅜" Everdur rods. The rods are notched and the molds are completed with the winding of miles of ⅛" Everdur wire.

The result is a mold engineered to last—combining exceptionally high strength with excellent resistance to corrosion.

Everdur alloys are available for either hot or cold working, ready weldability and free machining. These advantages have made Everdur a favored metal for save-all pans, head boxes, flow boxes, tanks, vats and linings and for screws, bolts, clamps and rustless hardware items in general. For information on properties of Everdur, send for Anaconda Publication E-5.

*Reg. U. S. Pat. Off. 47282

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Anaconda

COPPER & COPPER ALLOYS

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut

Subsidiary of Anaconda Copper Mining Company

In Canada: ANACONDA AMERICAN BRASS LTD.
New Toronto, Ont.

Marathon Moves Into New Carton Plant

(Continued from page 7)

clude: art, traffic, purchasing, standards, plant personnel, plant management, plant accounting, time study and production control.

The manufacturing operations, housed in the new building, are part of Marathon's completely integrated overall business operation. Controlling over 4,000 square miles of timberland in Canada, from which Marathon produces its own pulp, the company manufactures finished paper which it converts into packages and packaging materials for the food industry. The company's manufacture of carton and folding boxes has expanded greatly during the past 10 years, making the new plant necessary to handle present manufacturing activities and provide for anticipated growth during the immediate future. Departments moved to the new building permit the expansion of other manufacturing activities in the building space formerly occupied by those departments.

For the convenience of employees, modern locker facilities, comfortable restrooms and lunchrooms are provided in the new plant. A completely equipped first aid unit will administer to employee needs.

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Warren Steam Pump Company Celebrates 50th Anniversary

WARREN, Mass. — This town among the hills was the scene on Labor Day of a colorful celebration of the Fiftieth Anniversary of the Warren Steam Pump Company. A cloudless sky and the spacious grounds surrounding the plant, together with Phinney Field developed by the Company in 1944 as a playground and athletic field and donated to the Town of Warren, made a perfect setting for the various events.

The program began promptly at one o'clock with a tour of the plant by hundreds of visitors who were thrilled by the extensive array of modern equipment and the diversity of parts and materials which enter into the manufacture of the Company's centrifugal and reciprocating pumps.

Next on the program was a drill by the Palmer V. F. W. Fife and Drum Corps and their snappy blue and white uniforms, together with precision drill work made perhaps the most colorful event of the entire afternoon. This culminated by a flag raising ceremony in charge of a group of local Sea Scouts.

"Batter up" was the call at 3 p.m. as the high flying White Eagles A.A. of Ware opposed the Warren A.A. The Eagles recently became 1947 Champions of the Worcester County League, and as expected gave a good exhibition of baseball. However, the Warren boys proved a worthy opponent, and in a tight well-played game, came out on the top side of a 2 to 1 final score.

At seven o'clock the parking area on the Company grounds was the scene of a heavy concentration of guests, who assembled for the concert by Worcester Brigade Band and then later for the fireworks which could be seen to particularly good advantage from the baseball diamond on Phinney Field. It is estimated that several thousand people were in attendance at this time.

The Company's retired employes were personally conducted by H. Ward Hathaway, Manager of the Federal & Marine Dept.

The day's program closed with a dance in the Warren Town Hall at which there was a large gathering of employes, their families and friends. Jacques Renard and his celebrated orchestra thrilled both the dancers and the large audience which thronged the gallery.

Dr. Butler Joins Carborundum

NIAGARA FALLS, N. Y.—H. C. Martin, technical director of the Carborundum Company, announces the appointment of Dr. Gordon M. Butler, Jr., as a senior engineer of the Research Division, as of September 1. Dr. Butler was formerly associate director of research of the tool and die steel division and later chief metallurgist at the Dunkirk, N. Y., plant of the Allegheny Ludlum Steel Corporation.

Floors to Last a Lifetime

Another interesting application of GEON polyvinyl materials

THE maker of that floor in the picture won't say so—he says people wouldn't believe him. But chances are the floor will last a long lifetime. It's a new kind of tile—a plastic made from one of the GEON polyvinyl resins.

It's another case of selecting the *right* material for a given job. In this busy airlines ticket office the floor takes a terrific beating from morning till night. It has to resist wear, aging, sunlight, dirt, water, and many other normally destructive elements. It must clean easily, and stay fresh looking and attractive.

GEON resins can be compounded to provide these and many other properties in an amazing number of combinations to meet specific service conditions.

And they may be processed in many different ways—extruded, calendered or cast into sheet or film, pressure or injection molded. In latex or solution forms, GEON may be used to coat and impregnate fabrics, paper, and cardboard. Products made from GEON resins may be flexible or rigid—clear or opaque—brilliantly or delicately colored.

While we make no finished products from GEON or any other raw materials manufactured by B. F. Goodrich Chemical Company, we'll be glad to work with you on any special problems or applications. For more information, write Dept. U-10, B. F. Goodrich Chemical Company, 324 Rose Building, Cleveland 15, Ohio.

Photo courtesy United Air Lines

Floor tile manufactured by the Sloane-Blabon Corp.

B. F. Goodrich Chemical Company

A DIVISION OF THE B. F. GOODRICH COMPANY

GEON polyvinyl materials • HYCAR American rubber • KRISTON thermosetting resins • GOOD-RITE chemicals

DIGESTED

The GPO has by no means gotten back to easy going. In fact, we never want to see some of the easy-going conditions again. We have learned to do our best on every job and we are not going to be satisfied with something less. Oh, it's true that we would like a little relief from red-hot schedules on every job. We thought the end of the war would at least partly cure that. So far it has not done so; in fact, the ordering agencies think we should give faster service now than we did when the fighting was going on. Maybe they are right, only don't tell them I said so.

Let me close with a word about paper, since we are right here in the general neighborhood of some of the country's finest paper mills. The situation is a little better. The prices are so high I am kept busy explaining them; the quality is not so good as it might be, but at least the supply is better. Our Superintendent of Documents is able to supply sales copies of nearly all the titles in his price lists.—HON. A. E. GIEGENGACK, Public Printer of the U. S. *from an address before Connecticut Valley Club of Printing House Craftsmen.*

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1947		Corresponding Weeks—1946	
August 2	103.9	August 3	105.2
August 9	105.1	August 10	103.4
August 16	104.8	August 17	104.5
August 23	103.7	August 24	106.1
August 30 (Revised)	104.1	August 31	105.6
September 6	*84.7*	September 7	86.7

COMPARATIVE MONTHLY SUMMARIES

1946						1947	
Jan.	94.7	June	104.6	Dec.	97.0	Mar.	106.1
Feb.	98.4	July	94.0	Year Avg.	101.1	April	105.1
Mar.	104.4	Aug.	104.7			May	106.2
April	102.7	Sept.	101.3			June	106.0
May	100.7	Oct.	106.4			July	93.5
		Nov.	105.5			Aug.	104.2

COMPARATIVE YEARLY SUMMARIES

	1940	1941	1942	1943	1944	1945	1946	1947
Year to Date	86.2	94.5	92.6	87.9	87.5	87.7	99.8	*103.3*
Year Average	85.6	97.4	90.4	87.8	88.1	89.4	101.1	

PAPERBOARD OPERATING RATIOS†

Current Weeks—1947		Corresponding Weeks—1946	
August 2	99	August 3	98
August 9	97	August 10	96
August 16	100	August 17	98
August 23	100	August 24	100
August 30	99	August 31	100
September 6	*79*	September 7	83

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1946	90	91	100	99	94	97	89	99	96	100	99	92	96
1947	99	103	101	100	101	101	90	*99*					

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

†Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

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EDITORIAL

Tongass Timber

In its emphatically expressed desire to start the logs rolling down Alaska's streams to pulp mills which it proposes shall be built in that Territory the Forest Service of the Department of Agriculture has undertaken a program which ambitiously combines development with protection, exploitation with conservation. According to the prospectus covering the offer of the Tongass timber for pulp manufacture, the Forest Service, as agent for the United States, is deeply "interested in facilitating the establishment of the new industry by the purchaser and its operation on a commercially sound and permanently economical basis." It is estimated that this operation may supply direct employment for as many as 1,200 persons when the proposed installations are completed.

Major considerations in resource protection which are included in the proposed sale agreement call for handling of the timber on a sustained-yield basis, the safeguarding of salmon spawning streams which are important to the huge salmon industry of Alaska, the preservation of unusually fine scenic areas, and the prevention of stream pollution.

Terms of the offer proclaimed by the Forest Service said that prospective bidders for the timber must file with Lyle F. Watts, chief of the service on or before November 17, 1947, statements as to financial responsibility, experience in the making and distribution of pulp and paper products or in construction and operation of large industrial projects, and as to knowledge of the timber, water power and other operating conditions in the Territory, particularly in the area concerned.

The lowest bid price that will be considered for the timber intended for pulp manufacture and scaled on a cubic foot basis before July 1, 1960 is 85 cents per 100 cubic feet. The bidder must also agree to pay certain fixed prices during this period for timber cut for other uses than pulp. In addition he must agree to a small charge on the timber as cut, this money to be used by the Forest Service for improvement of the future timber stand on the area cut over. On July 1, 1960 and thereafter at five-year intervals during the life of the agreement, which is to run for 50 years, these prices and other important features of the contract will be subject to adjustment by the Forest Service to keep them in line with current market and operational conditions.

Preliminary award to the highest qualified bidder will be made at the close of the auction on December 15, and the $25,000 deposit of the successful bidder will be retained to be applied to the price of the timber or as liquidated damages in event he fails to carry out his part of the agreement. Within seven days, the successful bidder also must post with the Forest Service $75,000 in U. S. negotiable securities or draft or certified check payable to the Treasury of the United States as an additional guarantee of qualification for final award and execution of the sales agreement. Within one year thereafter, and before final award, the successful bidder must show that he has immediately available at least $8,000,000 for the plant construction and other expenses.

Production Value Pay

Though less than a month's experience with an innovation in payroll bonus plans may well be deemed a good deal less than adequate as basis for evaluating its value to everybody concerned the recently inaugurated plan of the Continental Paper Company in Ridgefield Park, N. J. may be said to have started well for its beneficiaries. On the strength of four weeks' record the employes appear to be doing all right. For the period from August 11 to September 7 the formula which sets aside a "production value" bonus turned in a profit of 30.7 per cent above his actual pay for the period.

The plan, written into a contract signed by the company and the United Paper Workers of America, CIO, sets aside 30.51 per cent of the concern's "production values" for distribution to the employes every twenty-eight days. This sum, which is determined by subtracting the cost of raw materials and supplies from the company's sales receipts, is in addition to the regular weekly pay received by the workers.

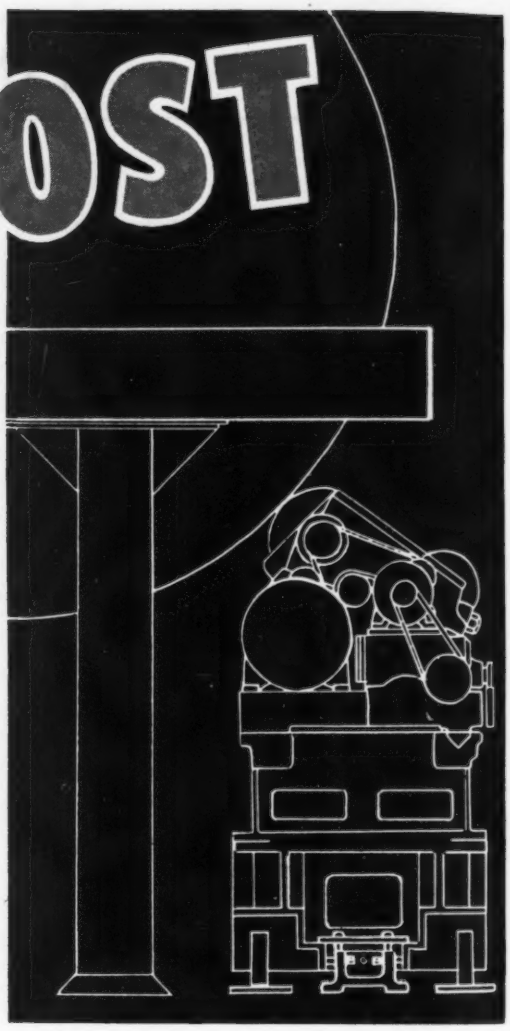
After the production value fund is compared with the wage payment and is found larger, 37½ per cent of the surplus is distributed in cash, the same amount is paid into a pension fund and the remaining 25 per cent goes into a reserve account against the possibility of any drop in income. The reserve account is paid out twice a year.

In terms of take-home pay this means that for each employe earning about $69 weekly the production profit for four weeks was found to be equal to about $84.75. Of this amount 25 per cent went into the reserve account, and the remainder was divided equally between the pension fund and the pay envelope. For his four weeks therefore the employe took home an added $32, acquires a like amount in the pension fund, and has a stake in $21 that he will receive, with similarly figured increments, at the end of six months—provided it is not lessened by a deficit operation during the period.

W. L. Cook

EDITOR

HOW TO CUT THE COST OF GRINDING YANKEE DRYERS



Paper mills operating Yankee dryers can save themselves a lot of money and increase their output by using the new Farrel dryer grinder.

HERE'S HOW: This machine grinds dryers in half or less of the time formerly required, cutting production interruption to an unprecedented minimum. In addition, the grinder does a more accurate job and gives the dryer a better finish.

THE GRINDER IS PORTABLE, built to roll on its own wheels to the dryer. After the dryer is ground in place, the grinder is rolled away and the dryer put back into production with a minimum of interruption.

OTHER CONSTRUCTION FEATURES INCLUDE: Farrel patented automatic crowning and concaving device which produces the exact curvature required; centralized electric control of all motors from a single, portable panel; pendant push-button stations located for operating convenience; and equipment for both wet and dry grinding. An attachment for turning down the dryer before grinding is also included. Grinders with either one or two grinding wheel units are available.

Write to Farrel for complete details.

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FB-384

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SECTION OF THE

TECHNICAL ASSOCIATION
OF THE PULP AND PAPER INDUSTRY

122 E. 42nd ST., NEW YORK 17, N. Y. Edited By R. G. MACDONALD, Secretary

Nonfibrous Raw Materials Report—1946*

By E. N. Poor[1]

The past year was the first since 1939 in which the nation was not engrossed in war. However, world peace was far from being synonymous with industrial peace for there were many strikes and other disturbances which had a pronounced effect on the supply of raw materials for the industry.

In spite of the difficulties, the production of paper and paperboard is estimated to be the record-breaking figure of 20 million tons. This was reflected in a heavy demand for nonfibrous raw material, in excess of supply in many cases.

Caustic Soda

Following the end of the war, most people expected that the alkali situation would become easier. This has not proved to be true and at present practically all deliveries are limited to contract quotas based on the customers' previous takings. The alkali plants are operating at full capacity but even so, they cannot produce enough caustic to meet the demand not only of the paper industry but of other industries. It is believed that most of the paper mills are getting as much, or perhaps more, caustic as they have been in the past few years. However, supplies of caustic will be tight during 1947.

There has been no variation in the quality during 1946, however, there has been some price adjustment in line with the increased cost of raw materials and labor. Considering that this is the first increase that the alkali industry has had in the past several years, it is believed that everyone appreciates the justice of the increase.

There have been no new significant uses developed during the past year. This is probably a reflection of the fact that the supply is so short.

While there is no substitute for caustic, it is sometimes possible to use small amounts of lime and soda ash although this use is in turn held down by the scarcity of soda ash. In some local areas, alkaline refinery wastes have been used but this is not a use which would be of much interest to the paper trade in general.

In regard to the outlook for 1947, as mentioned before this commodity will be short. There should be some relief due to the starting up of some CWS plants during 1947. Most of the alkali producers are revamping or remodeling their plants so that by the end of 1947 or early 1948 they should have increased production of caustic soda.

Soda Ash

The market for soda ash will probably continue tight into early 1948. Expansion of the soda ash industry during the war years was curtailed considerably, except for an insignificant tonnage, because of critical material shortages that would have been required for new construction. During this same period, alkali consuming industries such as aluminum, rayon, textiles, glass, paper, and chemicals were permitted to increase production or construct new facilities. This latter trend will continue during 1947.

The high quality of soda ash has been maintained under adverse operating conditions. Soda ash is one of the few basic materials used in the paper industry that has remained until recently at the prewar price level, despite substantial increases in manufacturing costs. In the Fall of 1946 the Office of Price Administration allowed a 5% increase in the price of bulk soda ash. An additional increase of approximately 9% became effective January 1, 1947.

Substantial quantities of soda ash have been used in semichemical pulping, and it is expected that this use will expand materially throughout the entire industry.

Soda ash continues to be the cheapest and most commonly used form of alkali for pulp manufacture. It can be converted readily to caustic soda, hypochlorite, sulphites, and sulphides; basic chemicals used in the industry. No economic substitute has been found to replace soda ash.

Several producers of alkalies are expanding their plant facilities, some of which were started immediately after cessation of hostilities. Due to special heavy equipment required and the continued shortage of materials of construction, expansion cannot be completed until late 1947 or possibly early 1948.

Interruptions in production in 1946 were caused by coal and other strikes. It is expected that if these interruptions do not recur in 1947, there should be some increase in soda ash supply for this year, but certainly not enough to meet industrial demands.

Lime

A tight market on lime was experienced during 1946, and that condition will probably continue during 1947. Several reasons contribute to the above state-

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* Presented by title at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 24-27, 1947.

[1] Member TAPPI, Chairman, Nonfibrous Raw Materials Committee; American Cyanamid Co., Stamford, Conn.

ment. 1st. A few small lime manufacturers have discontinued operation. It takes much longer to do kiln repair work due to the shortage of labor and materials, taking the kilns out of production for longer periods than normal. 2nd. New plants are starting operation that are regular and steady consumers of lime.

Prices on chemical lime increased in July, 1946. January 1, 1947, freight rates on lime increased 20%. If the cost of manufactured lime does not get out of hand it is not believed that there will be any general increase in lime prices.

All heavy consumers of lime should keep the lime storage filled for not only is there a shortage of lime, but a shortage of railroad equipment suitable for the shipment of lime. At the present time the lime manufacturer is not able to get enough railroad cars to fill his daily loading schedule, and with the harvest season coming on this condition probably will not improve.

Sulphur

At all times during the year adequate supplies of sulphur have been available. At the end of the year there was above ground in mine stocks and at distributing points more than a year's supply.

There have been no variations in price or cost during 1946.

No new uses for sulphur in the paper industry have come to our attention.

No substitutes for sulphur have been developed or proposed.

During the coming year supplies of sulphur will be adequate for all purposes.

Sulphur Dioxide

Sulphur dioxide has been available in 1946 and there is no reason to believe that there will be a shortage in 1947; however, the supply is approaching the current demand, but there is increasing production in sight that should take care of the usual demands during 1947.

Prices were increased about 10% effective January 1, 1947. Additional price increases will depend upon cost of raw material and labor demands.

No new uses for liquid sulphur dioxide, that were not already established at least in one mill, were reported.

The demand for liquid sulphur dioxide in the pulp and paper industry appears good for 1947. It will improve rapidly if several of the mills return to the high white bleaching of kraft mills and if the demand for fortification increases during the coming summer months as the demand for increased production continues to require maximum output with the available equipment.

Salt Cake

At the present time there is no salt cake available in any tonnage in the United States. Investigation shows the Province of Saskatchewan, Canada has recently constructed two reservoirs at Lake Chaplin which will have a brining capacity of from 45 to 50 million gallons each and which will represent a capacity of upwards of 100,000 tons per year, dry sodium sulphate basis. It is understood that there is a possibility that there might be some natural cake available in the Dakotas, the properties being controlled by Ozark Chemical Company.

Chile is expected to be an exporter to the States of salt cake some time during 1947 but nothing definite has been established as yet.

Due to the increased costs in production of muriatic acid and its byproduct salt cake there has been an upward trend price-wise during the year 1946.

Insofar as is known no new uses for salt cake have come to light during 1946.

While the whole paper industry has been looking into substitutes for salt cake, to date no substitutes have been found that are satisfactory.

Unless new sources of salt cake are found for 1947, the paper industry is going to be in a rather bad way. Apparently it will be some time before Europe is again an exporter, and the only possibility is to find new natural reserves in the United States plus new production imported from Canada and South America.

Chlorine

The quantity available for pulp and paper use for the year 1947 is substantially the same as the tonnage shipped during 1946.

Prices increased approximately 15% during last quarter of 1946, effective during 1947, with no variation in quality.

Indications are promising for somewhat larger production during latter half of 1947.

Sodium Peroxide

Sodium peroxide is expected to be available in increased quantities in 1947. There has been no change in the price or quality of sodium peroxide during 1946.

Use of sodium peroxide for groundwood bleaching has increased somewhat in 1946 and a substantial expansion is expected in 1947. Research and development work is showing favorable trends in applications for bleaching other types of wood pulps.

Hydrogen peroxide and sodium perborate are interchangeable with sodium peroxide for pulp bleaching. Economic considerations govern the choice of a peroxygen compound for this use.

Sodium Silicate

The supply of silicates of soda during the past year was not sufficient to meet all demands. Various producers suffered alternately from shortages of soda ash, tank cars, labor, and packages. These conditions have become stabilized and provide a basis for accurately predicting suppliers' ability to cover contract commitments. Certainly, the supply is adequate to eliminate need for substitute material.

The prices for the various grades of sodium silicate continued very stable—both liquid and solid grades remaining through 1946 at levels established in the last decade. Like many other industries, silicate producers have had to absorb various increased costs for raw materials, labor, etc., and these have largely eliminated profit margins. As a result, prices for all grades of sodium silicate were advanced on January 1, 1947, but continued stability seems likely at the new level.

During this past full year of peacetime operations, improved labor availability permitted continued close attention to plant control and quality standards. Thus, product quality has been and will be maintained at high levels.

After the past year's experience, silicate producers are able to better estimate their productive abilities, thus assuring users of present supply, plus reasonable

amounts for expansion and development of new uses. The entire pulp and paper industry will be interested in the use of silicates of soda with peroxide for bleaching both groundwood and textiles, as an aid in coagulation, of both raw and waste waters, in preventing corrosion, and in the manufacture of gels used as desiccants and catalysts in various cracking and synthetic chemical processes. Much unpublished information has accumulated during the past few years in all of these fields and is readily available to interested parties.

Rosin

By restricting exports during 1946, the supplies of rosin have been adequate for domestic users, although it has frequently been necessary to use paler and more expensive grades than would normally be preferred by many users. Increased production of both gum and wood rosin is expected to provide much better supplies during 1947, although the trend toward greater proportion of pale rosins will continue.

Prices remained firm through 1946 and following decontrol of prices, some grades soon reached all-time high values. The price trend during 1947 will depend to a great extent on export demand, which is expected to be very large, but with prices having reached extremely high levels, declines are to be expected when supplies begin to increase.

Considerable progress has been made in the conversion of rosin into special resins and resinous products for specific uses, and large quantities have been used in the production of synthetic rubber. This latter use will, of course, depend on the future of the synthetic rubber industry. Such uses will have only a modest effect on the over-all availability of rosin during the coming year, and supplies are expected to become increasingly plentiful as 1947 progresses.

Casein

Casein remained in short supply throughout 1946 and, as during the past three years, demand was satisfied only through importation of substantial quantities from Argentina. Final domestic production figures have not as yet been released, but the total is not expected to exceed 17,000,000 pounds, as compared with an estimated U. S. consumption requirement of approximately 65,000,000 pounds.

As the year closed casein prices had advanced to the unprecedented level of 50 to 52c per pound, having first increased from an OPA controlled price of 24c per pound early in the year to 33c in April, and finally responding to complete decontrol in September.

Although most proteinaceous materials, which have often been considered substitutes for casein, have also been in short supply during the year, the present extremely high price of casein has encouraged their use when available. Prospects are promising during 1947 for increased domestic casein production with a corresponding reduction in sales prices. An anticipated improvement in the availability of other raw materials used by casein consuming industries will undoubtedly create increased casein demand, and total U. S. requirements during the coming year may substantially exceed the estimated 1946 consumption.

Alum and Sodium Aluminate

Commercial Alum

The consumption of alum by the paper industry remained at full plant capacties during 1946. There were periods during the year when the supply was extremely short but in general, mill requirements were met.

The quality of commercial alum was equivalent to, or better than, prewar standards and is expected to remain high in view of the availability of good quality bauxite. Alum prices varied only between very narrow limits in 1946. Increases were generally within 10% of the prewar price.

Iron Free Alum

The supply and demand of iron free alum were approximately balanced during the year 1946 and quality was equal to, or better than, prewar grades. Prices advanced approximately 10%.

No change in the price, quality or availability is expected during the coming year, although the demand is expected to increase somewhat as mills improve the quality of paper.

Sodium Aluminate

Because of the alkali shortage, sodium aluminate has been in rather short supply during the past year. The price at the end of the year was approximately the same as at the beginning. Quality remained high.

Demand for sodium aluminate is expected to continue heavy throughout the coming year.

Starch

Needs or potential usage of starch last year exceeded the available supply. This applies to all starch using industries. The shortage was greater because of government corn grind restrictions which from April 1 to November limited corn processed to 80% of the corn processed in 1945. During the period of general shortages, it has not been possible to increase production capacities to the extent that potential usage has increased. Therefore, there has not been enough starch available for full usage.

There were violent fluctuations in corn prices following the expiration of O.P.A. on June 30, resulting in starch price increases of approximately $2.40 per cwt. total. Following the subsequent declines in corn costs, starch prices went down a total of approximately $2.57 and on December 31, 1946, they were approximately 17c per cwt. under December 31, 1945. Generally, it was possible to maintain or even improve full standard quality during the year.

For 1947, there is indication that the margin between potential usage and availability will be lessened but whether there will be enough starch for full usage remains to be seen. Some of the varied uses for starch may ease off somewhat but shortages of chemicals and other materials required in starch production have already put in their appearance and this condition can very well lower production.

Glue

The production of animal glue during 1946 was curtailed repeatedly due to causes beyond the control of the industry. Beginning with the coal strike in May, tannery operations, from which source raw materials for making animal glue are obtained, were cut back because of the coal shortage.

The tanning industry and in turn, the glue industry, was unable to make up the lost production as, following the coal strike, packing house operations were practically nil until the OPA died on June 30, 1946. Although cattle-kill was exceptionally good between July 1st and until OPA controls on the meat industry were reinstated, the supply of hides was depleted to such an extent that, under Government allocations, tannery production was restricted to an average of about 50% of former normal operations. This situation continued through early November and full

tannery production, resulting from decontrol of meats, hides, and ending of all Government control, was not resumed until December and raw materials therefrom for glue production, reflected in improved hide-glue production late in December and January, 1947.

The curtailed production of animal glue during 1946, compelled manufacturers to severely limit supplies to consumers and, inventories in hands of manufacturers and users became exhausted.

Although production has been restored close to the capacity of the industry, demand for animal glue continues greatly in excess of supply and until production requirements are met, working inventories are restored in producers and users' plants, it appears the animal glue industry will, out of necessity, be obliged to limit the acceptance of business and proportion production to consumers.

A gradual improvement in the supply situation is being realized and, considering forecasted peak production for packing houses and tanneries, raw materials for making animal glue are expected to be available to maintain and possibly improve the present production rate. Relief from foreign sources, both in the way of raw materials and animal glue itself is not anticipated due to world-wide shortages and the internal requirements of producing countries.

Since the end of price control, animal glue prices have increased an average of 25% above OPA ceilings. This advance is moderate considering the OPA roll-back of glue prices and raw materials for making animal glue when ceilings were established during early 1942, averaged close to 15%. Although the demand and present short supply warrants higher prices, suppliers of raw materials and manufacturers of animal glue are endeavoring to maintain an attractive price level. Further price increases are not now anticipated and will only be brought about through higher labor, raw material or manufacturing costs.

The uses of animal glue by the paper industry continue the same as during prewar days, although the shortage has introduced some substitutes for some uses. The manufacturers, as a whole, indicate a desire to resume the use of animal glue 100% in their operations as soon as quantities are available to satisfy such requirements.

Enzymes

The trend continues toward a greater use of enzyme converted starches for all types of starch applications in the paper industry which, of course, includes starches for sizing and coating and laminating adhesives. With the cost factor again assuming its proper importance since the end of the war, particular emphasis is being given to enzyme converted starches for laminating adhesives.

It is expected that the supply of enzymes will be ample to meet all demands. There have been no price changes nor major changes in the quality of emylolytic enzymes during 1946 and none are known to be contemplated during 1947.

Dyestuffs

Production of dyes in 1946 was at a very high level, even though dyestuff manufacturers were plagued with unusual operating difficulties due principally to shortages of certain crudes and important raw materials. While the paper industry experienced shortages of certain dyes, the supply on the whole was generally satisfactory.

Prices were maintained as of March, 1942 through the month of November. Beginning December 1st, they were advanced about 10% on the average. In general, quality was satisfactorily maintained.

The outlook for this year is that the large demand for dyes will continue. Barring unforeseen difficulties and with ample supplies of raw materials, dyestuff production may be greater in 1947 than in 1946.

Clay

Demand for china clay was fairly steady in 1946 with supplies tight most of the time. Outlook for 1947 is fair with prospects of increased domestic production and increases in foreign supplies.

Zinc Sulphide Pigments

The shortage which has existed in paper fiber, and the consequent tendency to use lighter weights while attempting to maintain opacity, has resulted in a heavy demand for technically pure zinc sulphide cryptone (containing approximately 50% zinc sulphite), and lithopone.

The postwar demands from all markets served by the various grades of zinc sulphite pigments have resulted in a very tight situation, in no way alleviated by increases in price. These increases ranged from 1¼c per lb. to the present price of 9½c for technically pure zinc sulphide, to ¾c per lb, increase to the present price of 5c for lithopone.

Every indication is that the paper industry, in common with all other consuming markets, would be using a considerably greater tonnage of these pigments if they were now available, inasmuch as it is well recognized that none of the commonly used fillers can compete in performance with the zinc sulphide pigments where a high degree of whiteness, brightness, and opacity is desired.

Titanium Pigments

Titanium pigments are still in short supply and are being delivered under quotas based on the past purchase records of customers. In general, it is possible to make reasonably prompt deliveries of these restricted quantities. No variation in price or quality is anticipated at this time.

It is rather generally recognized that the available supply of titanium pigments will not meet the demands of civilian users in 1947. Some increased capacity is expected by the industry during the year, but even when all of this is available the supply will still be quite far below the existing demand.

Synthetic Resins

Demand was far in excess of supply for all three types of material. As 1946 closed, the availability of the acrylics was gradually improving as was the case with the alkyds, although at a slower pace. The availability of the urea-formaldehyde resins did not improve during 1946. The price of the acrylics during 1946 was unchanged. Most alkyd resins increased greatly in price during 1946 due to the removal of OPA ceilings on the price of raw materials. Urea-formaldehyde resins increased only slightly during the year.

The acrylics found new use for improving the tear strength of paper as well as in various types of coatings where the ultimate of ultraviolet resistance and durability is required together with excellent color. Some of urea-formaldehyde resins have found use as agents for improving the pick characteristics of printing papers.

Barring a business recession, the demand for all resins should remain strong during 1947. Raw ma-

terial shortages will continue to play a dominant part.

The beginning of 1946 found the paper mills starting on postwar grades of paper. At that time, mills were experimenting on the use of wet-strength paper for civilian use. The application of properties of wet-strength and improved dry-strength carried on to an ever broadening application, and by the middle of 1946, all available supplies of resin were being used. By the latter part of 1946 the demand for wet-strength resins of the melamine type had increased beyond the ability to supply. This demand has maintained itself and even intensified during early 1947. Every indication points to a sustained high demand during the balance of 1947. Greatly increased supplies of the resin are not expected until late 1947 or early 1948. A ready market for these increased supplies appears to be in readiness. New grades of paper for fields in which paper had not been used before, figure in this increased demand.

The price on melamine formaldehyde resins has remained constant during 1946 and little change, if any, is anticipated for 1947. Numerous publications have appeared in the technical journals on wet-strength resins—both melamine and urea—and two papers, one dealing with the mechanism of resin binding of fibers and the other with a new process for defibering wet-strength broke were given at the TAPPI meeting in New York in February, 1947.

Wax Sizes

The consumption of wax sizes by paper manufacturers during the year 1946 was greatly influenced by the rosin situation. At the beginning of the year consumption of rosin was restricted which stimulated the consumption of wax size. However, when restrictions on rosin consumption were lifted the expected drop in the consumption of wax size did not materialize. When later in the year price controls on rosin size were abolished and rosin prices rose sharply, the consumption of wax size was stimulated. Doubtless, the question of economy has been a factor in influencing the use of wax sizes throughout the year. While the supply of rosin at the close of the year was more ample than that of the common grades of paraffin wax, there has been less price fluctuation in the latter.

During the first half of 1946 paraffin wax was subject to price control, white crude scale wax selling at $4.25 per hundred weight in barrels. When controls were lifted in the latter part of the summer, there were price increases and at the close of the year, this grade of wax was quoted at around 6c per pound. While fully refined paraffin normally sells, at least, 1c per pound above that of white crude scale wax, some quotations of the former have been below that of the latter.

As indicated above, paraffin wax is in short supply and this condition is expected to continue throughout the year of 1947. Future market fluctuations will depend a great deal on general business conditions but since costs of crude petroleum have been rising gradually, it is expected that the trend of the wax market will be upward if any change.

The price of wax has had the natural effect of pushing the price of wax sizes upward although such advances have not been comparable to those in the rosin size market.

The supply of paraffin-type waxes has been sufficient that very little substitution of other types of petroleum wax has been necessary. The wax size manufacturers have, for many years, used microcrystalline waxes to some extent but there is no evidence to indicate that the consumption of these grades of wax has tended to increase. Should the wax market advance substantially the natural effect would bring into use some of the lower grades of wax.

A few new grades of wax size have been introduced during the past year, but these have not differed radically from standard products which have been offered in years past. The applications of these products have, also, remained very much the same. The principle reason for employing wax sizes is to secure superior water resistance but flexibility of produce is, also, an important factor. Considerable wax size, also, is used in the size tube and calendar water box to improve finish, water resistance, scuff resistance, and resistance to printing ink absorption.

Plasticizers

A very tight supply is reported for all plasticizers. Manufacturers have, in some cases, increased their productive capacity without being able to ease the situation to any marked extent. Excessive demand, shortages of raw material, labor disturbances, and, in some cases, uncertainty of prices have all played a part in prolonging the scarcity of these important materials. All plasticizers, except invert sugar, are free from government control, but producers generally are finding it necessary to allocate supplies to established customers on the basis of past performance. Little hope can be held for immediate improvement, but many factors point to a gradual loosening up and substantial improvement in the latter part of the year.

Glycerine

Glycerine is currently in scant supply and is likely to continue so for at least the next few months. In January, however, for the first time in over 4 years, the manufacturers were reported to be running on normal soap production. If continued, this will result in an estimated production of glycerine, which, together with expected imports, is considered sufficient to take care of normal demand. Production, however, is dependent on continued ability to obtain fats and, if large quantities of fats are shipped abroad under the export-import program, glycerine production in this country will suffer accordingly. Should the present favorable conditions continue a gradual improvement is indicated, leading to something like normal later in 1947.

Elimination of the black market in meats has had a pronounced effect on the amount of fats available for soap production. Likewise, the fat salvage campaign has met with considerable success. The collection trend is reported to be upward and it is planned to continue the program.

Current quotations on domestic glycerine are ranging from 55c to 65c per pound with imported glycerine averaging about 80c.

Invert Sugar

Industrial consumers are at present limited to 60% of their base-period usage. The general expectation is that the ration will be increased later in the year.

There has been much discussion of late as to the advisability of extending the government rationing powers, which expire on March 31 under the 2nd War Powers Act, as well as the Price Control authority, which is now scheduled to expire on June 30. It is hard to see at present how the end of sugar rationing would result in greater supplies becoming

immediately available. Removal of price ceilings and the withdrawal of the Commodity Credit Corporation from the Cuban raw sugar market would probably result in the United States obtaining a larger share of the crop. However, those consumers who recall the chaos caused by widely fluctuating sugar prices after the 1st World War and the many business failures resulting, have not hesitated to voice their opposition to this course. Prices at present range from $7.80 to $8.25 per cwt. A potential increase in the ceiling of approximately 25c per cwt. is looked for in the near future.

Corn Sugar and Syrup

Here the situation has improved to some extent. With plenty of corn available, all mills are reported to be grinding at capacity and beginning to catch up on back orders. The overall demand is so persistent, however, that consumers are still being allocated. This demand is greatly aggravated by the shortage of cane sugar, and a real improvement is not expected to take place until such time as cane sugar supplies are more nearly back to normal. Current prices f.o.b. Chicago for dextrose are $7.23 cwt. in paper bags. Corn syrup at 42° Be is $4.15 cwt. in bbls. At 43° Be the price in bbls. is $4.20 cwt. All in car-load lots.

Glycols

Both di-ethylene and propylene glycol are in short supply and are being allocated by the producers. It is reported that deliveries may require 30 days to complete. No easing is expected for at least several months. Current prices for both glycols are: 14c lb. in tank cars; 15 lb. drums, carload and 16c lb. drums less than carload. All f.o.b. with freight allowed to destination.

Sorbitol

This is in very short supply. The producers are allocating the supply to their customers and are unable to take any new business. A long-awaited expansion in production capacity is now expected to take place in April. This expansion should materially increase the amounts available. Current quotation is 24c lb. f.o.b. plant.

Urea

This material has been coming into use as a plasticizing agent in late years, particularly as a extender for other agents such as glycerine in invert sugar. It is in exceedingly short supply. Customers are on strict allocation and no new business can be accepted. By governmental request, from 33 to 35% of all production is set aside for fertilizer, which greatly restricts the amounts available for other purposes. Current prices are from 4½c lb. up, depending on quantity.

Contributors to Report

Caustic soda	R. L. Carr, Mathieson Alkali Works, New York, N. Y.
Soda ash	John Schuber, Solvay Process Co., Syracuse, N. Y.
Lime	W. F. Swan, Standard Lime & Stone Co., Baltimore, Md.
Salt cake	W. F. Phillips, American Cyanamid Co., New York, N. Y.
Sulphur	D. B. Mason, Freeport Sulphur Company, New York, N. Y.
Sulphur dioxide	A. K. Scribner, Virginia Smelting Company, West Norfolk, Va.
Chlorine	S. W. Jacobs, Niagara Alkali Co., New York, N. Y.
Sodium peroxide	J. S. Reichert, E. I. DuPont, Niagara Falls, N. Y.
Sodium silicate	R. L. Kreyling, Phil. Quartz Co., Philadelphia, Pa.
Rosin	J. C. Dieffenderfer, Hercules Powder Co., Wilmington, Del.
Casein	J. C. Dieffenderfer, Hercules Powder Co., Wilmington, Del.
Alum and sodium aluminate	J. P. Bainbridge, Jr., Monsanto Chemical Co., Boston, Mass.
Glue	R. Tutt, Jr., Peter Cooper Corp., Gowanda, N. Y.
Starch	L. O. Gill, A. E. Staley Mfg. Co., Decatur, Ill.
Starch	J. P. Strasser, Stein-Hall & Co., New York, N. Y.
Enzymes	F. H. Denham, R. T. Vanderbilt Co., New York, N. Y.
Clay	Paper Trade Journal.
Zinc sulphide pigments	R. Davison, N. J. Zinc Co., New York, N. Y.
Titanium pigments	R. S. Perry, Jr., Titanium Pigment Corp., New York, N. Y.
Wax sizes	R. W. Kumler, American Cyanamid Co., New York, N. Y.
Synthetic resins	W. Louden, Resinous Products & Chemicals Co., Philadelphia, Pa.
Synthetic resins	K. E. Youngchild, American Cyanamid Co., New York, N. Y.
Plasticizers	N. R. Pike, Nulomoline Co., New York, N. Y.
Dyestuffs	C. F. Schauman, E. I. DuPont, Wilmington, Del.

John F. Rhoades

John F. Rhoades died of a stroke at Havre de Grace, Md., on August 22nd, following a long illness.

Mr. Rhoades was born at Rockland, Maine, on February 18, 1882, and started in the industry with the Burgess Sulphite Fibre Company, Berlin, N. H., where he served for two years as a draftsman. During the next seven years he was a mill engineer on design and construction for th Great Northern Paper Company, Millinocket, Maine. This was followed by a year with the Brompton Pulp and Paper Company at East Angus, Que., as chief engineer. He then joined the Management Engineering and Development Company at Dayton, Ohio, for two and one-half years, from which he transferred to the Mead Corporation at Chillicothe, Ohio, where he remained for twenty-one years as chief engineer. A few years ago he joined the Johnson & Wierck consulting engineering firm in New York and later became associated in turn with Hardy S. Ferguson of New York and the H. K. Ferguson Company in Cleveland. Because of illness he had to retire from the latter firm and went to Boston. Mr. Rhoades passed away while on a recent visit to his daughter at Havre de Grace, Md.

Mr. Rhoades was active for several years in the Engineering Division of the Technical Association of the Pulp and Paper Industry and from 1931-1933 served as a member of its Executive Committee. He was buried at Havre de Grace and is survived by his wife and daughter. Mrs. Rhoades is now visiting his sister at 43 Mount Albany Street, Watertown, Mass.

TAPPI Notes

Arthur A. Bernhardt, formerly of the Army, is now junior chemist for the Kalamazoo Vegetable Parchment Company, Parchment, Mich.

Lt. Col. Augustus S. Hocker is now with the 4th Engineer Construction Group, Kyoto, Japan.

Correction in TAPPI Standard T429 m-44

A typographical error has been discovered in this standard. Under "Procedure for Alpha-Cellulose" equation (B) near the end column should be $ml = 2\,(5 - v_2 \times r)$.

The Decomposition of Methylated Sprucewood*

By F. E. Brauns[1] and Jack J. Yirak[2]

Abstract

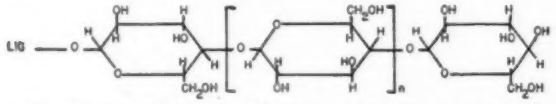
The possible ways in which lignin can be combined to other wood components in lignified materials are discussed.

Methylated sprucewood, when decomposed with methanol in the presence of a small amount of hydrogen chloride, gives a methanol lignin with 30.6% methoxyl content. When the methylated wood is decomposed with phenol and hydrochloric acid, a partially methylated phenol lignin containing 3 phenol groups and 16.4% methoxyl is obtained. Methylated sprucewood is not changed by 5% sodium hydroxide at 175 to 180°.

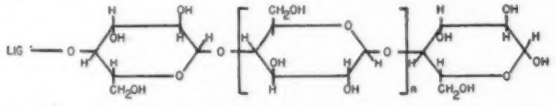
The question of whether the lignin in wood and in lignified material in general is chemically combined with other components of the plant or whether it is in a purely physical mixture, is of great scientific interest. In spite of a tremendous amount of research work in wood chemistry which has been going on for over a hundred years, this question is still unanswered, although as early as 1838 Payen and other wood chemists had tried to find an answer. In the course of this time, two theories have been developed: the incrustation theory *(1)*, which assumes that the lignin is mechanically mixed with other plant components, and the chemical combination theory *(2)*, which assumes a chemical combination of the lignin with carbohydrates. Although many reasons have been given for each of these theories, no definite experimental proof has been presented for either of them. The present work is an attempt to do this.

If the lignin is chemically combined with carbohydrates, it can be in one or several of the following ways:

A. In a glucosidic type of combination, the lignin taking the place of an aglucon, whereby one aliphatic or phenolic hydroxyl group of the lignin is combined with the glucosidic hydroxyl group of a carbohydrate chain.

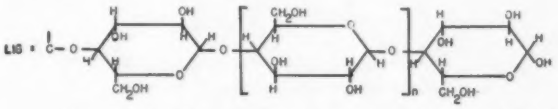


B. By an ether-type linkage, whereby an aliphatic or aromatic hydroxyl group of the lignin has reacted with a nonglucosidic hydroxyl group of the carbohydrate.

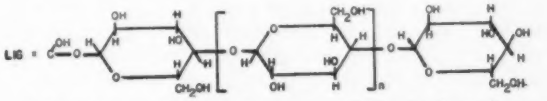


C. By acetal or half-acetal formation at the carbonyl group of the lignin:

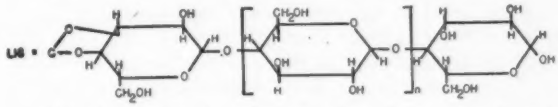
(1) the enolized carbonyl group of the lignin has reacted with one of the nonglucosidic hydroxyl groups of the carbohydrate.



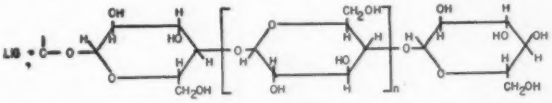
(2) one of the hydroxyl groups of the hydrated carbonyl group has reacted with a nonglucosidic hydroxyl group of the carbohydrate.



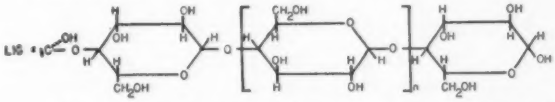
(3) the two hydroxyl groups of the hydrated carbonyl group have reacted with two hydroxyl groups of the carbohydrate in a manner similar to the reaction of benzaldehyde with sugars whereby benzylidene rings are formed.



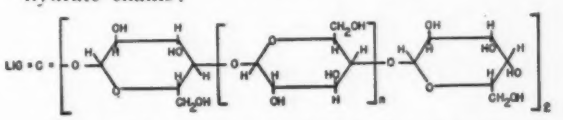
(4) the enolized carbonyl group has reacted with a glucosidic hydroxyl group.



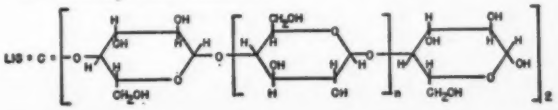
(5) the hydrated carbonyl group has reacted through one of its hydroxyl groups with a glucosidic hydroxyl group with the formation of a half-acetal type compound.



(6) the hydrated carbonyl group has reacted through both hydroxyl groups which are combined with (a) the glucosidic hydroxyl group of 2 carbohydrate chains:



(b) a primary or secondary hydroxyl group of 2 carbohydrate chains:



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* Presented by title at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Commodore, New York, N. Y., Feb. 24-27, 1947.

A portion of a thesis submitted by the junior author in partial fulfillment of the requirements of The Institute of Paper Chemistry for the degree of Master of Science from Lawrence College, Appleton, Wis., May, 1942.

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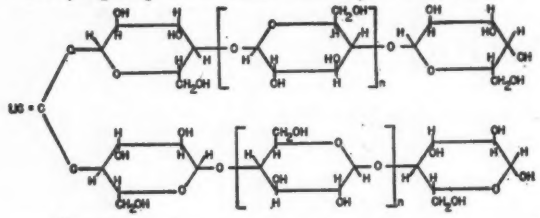
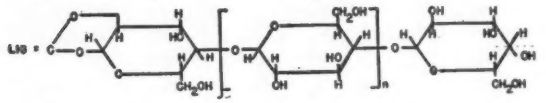
[2] Member TAPPI; Chemical Engineer, Union Bag & Paper Corp., Savannah, Ga.

(c) the glucosidic hydroxyl group of one carbohydrate chain, and a primary or secondary hydroxyl group of another carbohydrate chain.



(7) the hydrated carbonyl group has reacted through both hydroxyl groups with a glucosidic hydroxyl group, and the hydroxyl group at C atom 2 of the same glucose anhydride chain member, forming a cyclic acetal compound.



Ester linkage between the lignin and uronic acids seems improbable because, in this case, the carbohydrates would be soluble in Schweizer solution as such esters would be saponified by the alkaline copper ammonium hydroxide solution. Even if ester linkages between lignin and an acid were present in wood, such an ester bond would readily be saponified during the methylation with alkali and dimethyl sulphate.

If the lignin is combined with a carbohydrate component in one or several of the ways just mentioned, one or more of the hydroxyl groups in the lignin building unit are covered and therefore deprived of their reactivity—e.g., of their capacity of being methylated; the same of course, holds for a corresponding number of hydroxyl groups of the carbohydrate component. In Table I, the percentages of methoxyl content are given for lignin at various stages of methylation based upon a lignin building unit of a molecular weight of 840.*

TABLE I.—METHOXYL CONTENT OF LIGNIN AT VARIOUS STAGES OF METHYLATION

Lignin Derivative	Number of MeO Groups	Molecular Weight of Lignin Building Unit	MeO, % (Brauns, 2) Calculated	Found
Original lignin	4	840	14.78	14.8
Methylated lignin	5	854	18.16	18.3
Methylated lignin	6	868	21.44	21.4
Methylated lignin	7	882	24.62	24.4
Methylated lignin	8	896	27.70	...
Methylated lignin	9	910	30.68	30.3
Fully methylated	10	942*	32.93	32.3

* The increase of 32 is the result of acetal formation at the carbonyl group whereby CH_2OH (molecular weight 32) must be added.

It can be seen from Table I that, if the lignin is present in the wood in a free state (incrusting theory) it should yield, upon methylation, a fully methylated lignin with about 32.9% methoxyl. In fact, isolated native spruce lignin, after three to four methylations, is easily methylated to 32.3% methoxyl *(4)*, whereas hydrochloric acid spruce lignin reaches a methoxyl value of 32.2% after five methylations *(6)*. The fact that the soluble isolated native lignin and the insoluble hydrochloric acid lignin can both be methylated to the same final value indicates that the insolubility of the hydrochloric acid lignin cannot be the result of condensation of lignin building units through hydroxyl groups but of a polymerization through other groups or valencies. If the lignin is combined with other components in the wood (chemical combination theory) through an oxygen bridge, the methoxyl content of lignin in fully methylated wood will be less than 32.9%. Even if the lignin in the wood has only four free hydroxyl groups capable of being methylated, the methylated lignin should have a methoxyl content of about 27.7%.

The following considerations also show that, from a fully methylated sprucewood, a partially methylated lignin with a methoxyl content of around 28% should be obtained.

Sprucewood consists of about 55.5% of hexosans (chiefly cellulose), 12.7% of pentosans, 3.6% of polyuronic acids, and 28.3% of lignin. Fully methylated cellulose (hexosans) contains 45.62% methoxyl; fully methylated pentosans (e. g., xylan), 38.8%; fully methylated polyuronic acids, 42.7%; and fully methylated lignin, 32.9%. The methoxyl value for cellulose (and this holds also for the other carbohydrate components in the wood) depends upon the chain length of the carbohydrates. As can be seen from Table II, a glucose anhydride chain with 50 C_6 units, on complete methylation, has a theoretical methoxyl value of 46.02%; one with 500 C_6 units, a methoxyl value of 45.66%; and one with an indefinite chain length, a limiting value of 45.62%. Assuming that all these components are present in the wood uncombined and that none of them is removed, even partly, during the methylation, fully methylated sprucewood would have a methoxyl content of about 41%:

$$(55.5 \times 45.6) + (12.7 \times 38.8) + (3.6 \times 42.7) + (28.2 \times 32.9)/100 = 40.9$$

(The first value in each term is the content of the component in the wood, the second value is the methoxyl content as given above.)

TABLE II.—METHOXYL CONTENT OF METHYLATED GLUCOSE ANHYDRIDE CHAINS OF VARIOUS LENGTHS

No. of C_6 Units	Ratio of Glucose To Glucose Anhydride Groups	Number of Hydroxyl Groups	Mol. Wt.	Mol. Wt. of Methylated Product	MeO, %
1	1:0	5	180	250.1	62.04
2	2:0	8	342	454	54.67
3	2:1	11	504	658	51.86
4	2:2	14	666	862	50,38
5	2:3	17	828	1066	49.47
6	2:4	20	990	1270	48.85
7	2:5	23	1152	1474	48.408
8	2:6	26	1314	1678	48.069
9	2:7	29	1476	1882	47.803
10	2:8	32	1638	2086	47.590
20	2:18	62	3258	4126	46.617
30	2:28	92	4878	6166	46.288
40	2:38	122	6498	8206	46.122
50	2:48	152	8118	10246	46.022
60	2:58	182	9738	12286	45.955
70	2:68	212	11358	14326	45.910
80	2:78	242	12978	16366	45.873
90	2:88	272	14598	18406	45.845
100	2:98	302	16218	20446	45.822
150	2:148	452	24318	30646	45.759
200	2:198	602	32418	40846	45.719
500	2:498	1502	81018	102046	45.661
1000	2:998	3002	162018	204046	45.643
2000	2:1998	6002	324018	408046	45.632
∞	2:∞	$2+3_x$	$(162)_x$	$(204)_x$	45.618

The highest methoxyl content found for fully methylated sprucewood is 38.5%. If, during the methylation, components of the wood are dissolved in the same ratio as they are present in the wood, such a loss would have no effect upon the final methoxyl content of the methylated wood. If, however, one

* In order to avoid any misunderstanding, it should be emphasized that the lignin building unit with a molecular weight of about 840 is not the lignin molecule itself. A lignin building unit of this molecular weight was found on the basis of the analytical results of many lignin derivatives by various lignin chemists *(3)* and has a definite number of typical groups such as four methoxyl groups, three aliphatic and one phenolic hydroxyl group, and one carbonyl group. *(4)* In spite of the fact that the molecular size of 840 fits into the calculation of many analytical results, it still is a tentative figure and is used as a working hypothesis in which respect it has been found very helpful. The size of the lignin building unit may have to be changed somewhat later when the structure of the lignin building unit is definitely known. Until that time, the figure of 840 will be used unless there is an urgent reason for an immediate change. The lignin building unit is composed of lignin building stones which may be linked together in various ways *(5)*. The molecular weight of lignin itself is considered to be a multiple of 840 (Freudenberg, *2*).

component of the wood is dissolved to a larger extent than others, then the methoxyl content of the methylated wood will be changed. Removal of pentosans and polyuronic acids will have little effect, whereas the removal of hexosans will lower the methoxyl content and the removal of lignin will increase it. In fact, a part of the wood is dissolved during the methylation. Unfortunately, neither the exact amount nor the composition of this portion is known at present. If only lignin and hexosans are left in the methylated wood without any loss of either, the methoxyl content would be 41.2% [55.5 × 45.6 + 28.2 × 32.9 / (55.5 + 28.2) × 100 = 41.2]. The difference of about 3% between the calculated value (41.2%) and the found value (38.5%) may be caused by one or several of the following factors: (a) the wood as a whole is not fully methylated because of its physical structure; (b) the carbohydrate fraction is not fully methylated—it is known that the final 1% of methoxyl can be introduced into the cellulose only with difficulty; (c) the lignin is not completely methylated in spite of the fact that hydrochloric acid lignin, which still has the physical structure of the wood, is easily and completely methylated in four to five methylations; (d) the lignin is chemically combined with another wood component through an oxygen bridge. In the last case, hydroxyl groups of the lignin and of the carbohydrate would disappear. The loss of a hydroxyl group in a cellulose chain of 2000 C_6 units has no effect upon the final methoxyl content (see Table II); the loss of one hydroxyl group in a lignin building unit, however, will cause a decrease in its methoxyl content of about 3% (see Table I). This decrease would cause a decrease in the methoxyl content of the fully methylated wood (substitute 27.7 for 32.9 in the first equation) and of the lignin-hexosan fraction (substitute 27.7 for 32.9 in the second equation) to 39.6%, whereas, if two hydroxyl groups of the lignin building unit are occupied by oxygen bridges, the calculated methoxyl contents would be 38.7 and 38.5% respectively. Although these values agree quite well with a methoxyl value (38.5%) found for fully methylated sprucewood, they are only of theoretical interest, because the composition of the wood after methylation is unknown. Although a gain of at least 30% is expected, the methylated wood recovered is only 90 to 95%, the remainder being dissolved during the methylation.

In order to determine whether or not the lignin is combined with another component of the wood in one of the above mentioned ways, the method of complete methylation followed by hydrolysis, which is often used for the clarification of the structure of glycosides, has been applied.

Experimental Part

Methylation of Sprucewood

A freshly cut black spruce log was transformed into sawdust and immediately placed in 96% alcohol. It was extracted twice with 96% alcohol at room temperature, each extraction being for 24 to 48 hours. The sawdust was then extracted in a Sohxlet apparatus with a 1:1 benzene-alcohol mixture for 24 hours, filtered, and washed with alcohol and water. The extracted material was beaten in an experimental Valley beater for 18 hours, after which it was given a 48-hour pebble-mill treatment. This caused a considerable disintegration and hydration of the wood. It was then separated from the water, either by filtration or by centrifuging it in a basket centrifuge. The wood flour was then again extracted with 96% alcohol, filtered, washed with water, and pressed as dry as possible. It was stored under alcohol.

About 110 grams of moist wood meal, corresponding to 30 grams of ovendry wood, was washed with water, placed in a 2-l. round bottom, 3-necked flask equipped at its side-necks with two 250-ml. graduated dropping funnels, one having a gas inlet, the other a gas outlet tube. The center neck had a motor driven stirrer with a mercury seal. The air in the flask was replaced by nitrogen and the flask cooled with ice. Then 200 ml. 45% sodium hydroxide was added through one of the dropping funnels and the mixture stirred for 15 to 30 minutes, allowing the temperature of the water bath to rise to 20°. Next, 150 ml. dimethyl sulphate was added dropwise through the other dropping funnel over a period of 5 to 7 hours with stirring, keeping the temperature at 20° and bubbling a slow nitrogen current through the apparatus. When about half the dimethyl sulphate had been added, strong foaming was encountered which was counteracted by the addition of a few drops of capryl alcohol. After all the dimethyl sulphate had been added, stirring was continued overnight. The next day, the stirrer was replaced by a wide glass tube leading from the bottom of the flask to the top of a small closed basket centrifuge, which was also connected with the nitrogen tank. The contents of the flask were then forced by means of nitrogen into the centrifuge and in this way the liquor was separated from the wood meal with exclusion of air. This filtration began relatively easily but, when the wood meal was washed with dilute (5%) sodium hydroxide, the filtration slowed down considerably. The wood meal was then washed with 200 ml. distilled water, 100 ml. 1% acetic acid, and again with water. It was centrifuged as dry as possible and remethylated in the same manner. After three such methylations, difficulties with foaming or during the filtration were no longer encountered.

The wood meal was methylated ten times in this way: after each three methylations, it was given a 10-hour ball-mill treatment in order to disintegrate small lumps which had formed during the methylation. For methoxyl determinations a small portion of the moist, partially methylated wood was suspended in water, centrifuged, and the supernatant liquor decanted. It was then suspended in absolute methyl alcohol, filtered into a small Sohxlet extraction thimble, and dehydrated by consecutive extraction with absolute methanol, dioxane, ether, benzene, and low boiling petroleum ether. To remove the last traces of water from the wood meal, calcium oxide was added to the methanol and barium oxide to the dioxane and the benzene in the flask. Each extraction lasted at least four hours. The thimble was then transferred to a vacuum desiccator and the wood meal dried over concentrated sulphuric acid and sodium hydroxide and, finally, in an Abderhalden at 100° and 12 mm. over phosphorus pentoxide.

After the first methylation, the methoxyl content had increased from 4.7% to 28.1%; after the second, to 32.5%; after the third, to 34.3%; the sixth, to 37.4%; the seventh, to 37.9%; and the eighth, to 38.1%. This value did not increase after three more methylations. After the last methylation, the wood meal was thoroughly washed with distilled water, allowed to stand in 1% acetic acid for 5 to 6 hours, and again washed with distilled water until neutral. The methylated sprucewood was then washed once with methyl alcohol, filtered, and kept in a moist con-

dition. When the water-moist methylated wood was dried, it became horny and could no longer be ground. In order to obtain it as a finely divided powder, it was dehydrated as described above. The yield from 100 grams of wood was about 90 grams. The moist methylated sprucewood was of a canary yellow color, whereas the dehydrated product was very light cream colored.

Anal.: MeO, 38.4% (ash-free basis); ash, 0.87%.

LIGNIN DETERMINATIONS

(a) Klason method. For the lignin determination, the wood meal was ground and sifted through a 60-mesh sieve. An accurately weighed sample (about 1 gram) was added with stirring to 20 ml. 72% sulphuric acid at 5°. The temperature was allowed to rise to room temperature and the mixture was stirred for 2 hours at 25°. It was washed into a 2-liter Erlenmeyer flask, diluted to 770 ml., and boiled for 4 hours. The lignin was then collected on an A2 Berlin filtering crucible, washed thoroughly with distilled water, and dried at 105°. It was very light brown in color.

Lignin found: 38.7, 38.9% (ash-free basis);
MeO in lignin: 31.2, 31.1% (ash-free basis);
Ash in lignin: 1.5%.

(b) Hydrochloric acid method. About 3 gram of moist wood containing 64.7% moisture was suspended in 20 ml. 42% hydrochloric acid, saturated with dry hydrogen chloride, and shaken for 2 hours at room temperature; 6.5 grams ice was then added and the mixture kept for 18 hours at room temperature. After further dilution with 6.5 ml. water, the lignin was centrifuged, washed with distilled water, transferred to an Erlenmeyer flask, and boiled for 15 minutes. It was then filtered and washed as in the Klason method.

Lignin found: 27.3% (ash-free basis);
MeO in lignin: 25.6% (ash-free basis);
Ash in lignin: 2.8%.

ISOLATION OF METHANOL LIGNIN FROM METHYLATED SPRUCEWOOD BY MEANS OF METHANOL AND HYDROCHLORIC ACID.

Moist methylated sprucewood, corresponding to about 10 grams of ovendry wood, was dehydrated in a Soxhlet apparatus with absolute methanol. The extraction flask contained calcium oxide which was renewed several times until the drained alcohol was free of water. The methanol-moist wood was then transferred into a bomb tube with about 100 ml. anhydrous methanol. Enough absolute methanol containing anhydrous hydrogen chloride was added to this suspension to give a 1% hydrogen chloride solution, causing the wood meal to turn green in color. The bomb tube was then heated in a tilting oven to 120 to 125° C. and kept at that temperature for about 20 hours. About half the wood meal appeared to have gone into solution. The bomb tube was then cooled in an ice-salt mixture, opened, and the brown contents poured into a centrifuge jar. Considerable pressure in the tube (even after cooling) and frothing of the solution while being poured out indicated the presence of a low boiling compound, probably methyl ether or methyl chloride. The mixture was centrifuged and the residue washed with dioxane which dissolved more of the material. The combined solutions were evaporated *in vacuo* to dryness, the residue was taken up in dioxane, and the lignin isolated by pouring the filtered solution into 4 liters of water to remove any water-soluble compounds. The crude methanol lignin derivative was filtered, dried, and purified twice by dropping its dioxane solution into anhydrous ether, washing the product twice with ether and petroleum ether, and drying. The yield was 2.1 grams.

Anal.: C, 66.6%; H, 6.8%; MeO, 30.6%.

METHYLATION OF THE METHANOL LIGNIN WITH DIAZOMETHANE.

A sample of purified methanol lignin was dissolved in 5 ml. of anhydrous dioxane and methylated by passing diazomethane, prepared from 5 ml. of ethyl *N* - nitroso - *N* - methylcarbamate, into the solution. There was no visible nitrogen evolution. After standing overnight, the solution was heated for half an hour at 50°, centrifuged, filtered, and the lignin isolated and purified in the usual way.

Anal.: C, 66.65%; H, 6.7%; MeO, 31.7%.

ACTION OF SULPHURIC ACID ON THE METHANOL LIGNIN.

When the methanol lignin was treated with 72% sulphuric acid in a Klason lignin determination, the lignin was recovered in 93.5% yield. This treatment resulted in a product with a methoxyl content of 24.6%, which was not changed after a second treatment.

PHENOLYSIS OF FULLY METHYLATED SPRUCEWOOD MEAL.

Fully methylated moist sprucewood meal, corresponding to 10 grams of ovendry wood, was mixed with 150 grams of redistilled phenol. The water was removed from the wood meal by distillation under reduced pressure. With progressive removal of the water, the wood meal swelled and finally formed an orange gel. After the mixture had been made up with phenol to approximately 150 ml., sufficient dry ether containing anhydrous hydrogen chloride was added to give a 1% hydrogen chloride solution. The color of the mixture changed from orange to greenish-blue and the wood started to dissolve. Finally the mixture turned violet-blue in color. It was heated on a water bath for 1 hour, which caused the formation of a clear violet-blue solution. The excess phenol was then distilled off as far as possible under reduced pressure; the residual dark tar was dissolved in anhydrous dioxane, giving an olive-green solution. This was centrifuged and the clear solution decanted from a small amount of residue (0.3 gram) which consisted chiefly of inorganic material. The filtered dioxane solution was then added dropwise to 4 liters of vigorously stirred distilled water. The precipitate was filtered, washed thoroughly with distilled water, and dried in a desiccator over sulphuric acid and sodium hydroxide. The crude phenol lignin, obtained in 6.5 grams yield, had a methoxyl content of 16.4%.

The aqueous mother liquor, upon evaporation under reduced pressure and extraction of the residue with ether, yielded a product which consisted chiefly of the methylated carbohydrate portion. It reduced Fehling solution strongly after hydrolysis with hydrochloric acid.

The crude phenol lignin derivative was purified by dropping its dioxane solution into anhydrous ether which caused the separation of an ether-insoluble, partially methylated phenol lignin. From the dioxane-ether mother liquor, a second crop was isolated by evaporating the solution *in vacuo* to dryness, taking up the residue in a small amount of anhydrous dioxane, and dropping the solution into ether. The total yield was about 3.0 grams. The phenol lignin

derivative was purified from dioxane and ether in the usual way.

Anal.: C, 69.2%; H, 6.3%; MeO, 16.5%

Isolation of the Ether-Dioxane Soluble Phenol Derivative.

The orange-red ether-dioxane mother liquor was evaporated to dryness *in vacuo*, the residue dissolved in about 75 ml. of absolute methanol, centrifuged, filtered, and the solution added dropwise to 4 liters of vigorously stirred distilled water. The solution was stirred for several hours to coagulate the colloidal precipitate, the latter filtered, washed with distilled water, and dried in a desiccator over sulphuric acid and sodium hydroxide. The yield was about 3.3 grams.

Anal.: C, 71.6%; H, 6.5%; MeO, 11.7%.

Methylation of the Two Phenol Lignins With Diazomethane

Samples of the two phenol lignins were methylated in dioxane solution with diazomethane, isolated, and purified in the same way as their parent derivatives.

Anal: MeO, 23.4% (ether-insoluble product)
MeO, 23.3% (ether-soluble product)

Both products were soluble in dioxane, pyridine, and acetic acid, and insoluble in water and dilute sodium hydroxide.

Action of Dilute Sodium Hydroxide on Fully Methylated Sprucewood

Moist methylated sprucewood (57 grams or 20 grams ovendry material) was mixed in an autoclave with sufficient sodium hydroxide solution so that, if the water present in the wood meal is taken into account, a 5% sodium hydroxide solution is formed, and 25% sodium hydroxide (based upon the weight of ovendry wood) is present. The mixture was allowed to stand overnight to permit the sodium hydroxide to come to an equilibrium with the moisture in the wood meal. The mixture was then heated for 2 hours at 175°, using a wax bath to prevent local overheating. After cooling, the contents were filtered and the residue was washed with dilute sodium hydroxide solution, distilled water, 1% acetic acid, and again with distilled water. The filtrate was very slightly colored and on acidification gave only a trace of a precipitate. The residual wood, although slightly darker in color, appeared to be unchanged. It was dehydrated by extraction with alcohol, dioxane, ether, benzene, and low boiling petroleum ether, and dried in a desiccator over sulphuric acid. The yield was almost quantitative. It had a methoxyl content of 38.4%. The lignin content, determined by means of 42% hydrochloric acid, was 25.2% and the lignin obtained had a methoxyl content of 24.6%.

Discussion

The methylation of sprucewood, as described above, gives a product with a final methoxyl content of 38.4%, which did not increase further when a sample was suspended in anisole, the water distilled off with anisole as an azeotropic mixture *in vacuo*, and the mixture treated with sodium in liquid ammonia and methyl iodide according to Muskat *(7)*. The replacement of the water by anisole caused a considerable swelling of the wood. The methoxyl content of 38.4% is the same as that obtained by Urban *(8)* and is also in good agreement with that found by Brauns and Hibbert *(6)*. In order to avoid any degradation of the cellulose by the oxygen of the air, the first three methylations were carried out in a nitrogen atmosphere. After these methylations the methoxyl content of the wood was about 35% and this precaution was considered no longer necessary. Because about 35 to 40% of the wood was present in the alkaline solution, it was impossible to carry out any calculation of the ratio of lignin to carbohydrate in the methylated wood. It is evident that this ratio will decrease because the weight of pentosan and hexosan fractions increases from practically 0 to 38.8 and 45.6%, respectively, whereas the weight of the lignin which had already 15% methoxyl content, would increase only from 15 to 17% if the lignin was free in the wood. There is little doubt that the alkali-soluble portion also contains some lignin. This portion is now under investigation.

It was recently shown by Freudenberg and Ploetz *(9)* that the standard lignin determination with 72% sulphuric acid is not suitable for deciduous woods. It is well known that these woods contain considerable amounts of methylated carbohydrates which, when treated with mineral acids, give insoluble lignin-like methoxyl-containing precipitates *(10)*. It was therefore not surprising that erratic results, varying from 36 to 54% lignin (with methoxyl contents from 28 to 33%), were found with methylated sprucewood. The fact that the higher the yield of lignin, the higher the methoxyl content, indicates that these lignins are contaminated by decomposition products of methylated carbohydrates. This is further confirmed by the fact that, when the methanol lignin isolated from the methylated wood is subjected to a treatment with 72% sulphuric acid, a normal, partially methylated Klason spruce lignin is obtained. When, however, 42% hydrochloric acid is used for the determination of the lignin in the methylated sprucewood, a lignin content of 28.2% (with a methoxyl content of 25.7%) is obtained. This methoxyl content is about 10% higher than that of the lignin from unmethylated sprucewood and about 6 to 7% lower than that of a fully methylated lignin. Treatment of the methanol lignin with 72% sulphuric acid, as in a lignin determination, gives a Klason lignin with 24.6% methoxyl, corresponding to seven methoxyl groups and indicating the loss of two methoxyl groups. As will be shown in a forthcoming paper, fully methylated spruce lignin, when treated with 72% sulphuric acid, also loses two methoxyl groups as does methanol lignin and the partially methylated methanol lignin.

When the methylated sprucewood is heated with methanol containing 1% hydrogen chloride, a methylated methanol spruce lignin with 30.6% methoxyl content is obtained which corresponds to nine methoxyl groups per lignin building unit (see Table I). Methylation of this methanol lignin with diazomethane increases the methoxyl content by about 1%. A similar increase was observed when diazomethane-methylated native spruce lignin, after treatment with methanol-hydrogen chloride, was remethylated with diazomethane *(4)*.

When the methylated spruce wood is heated with phenol in the presence of a small amount of hydrogen chloride at 90°, it is completely dissolved. From the solution, a crude phenol lignin is isolated in 65% yield which can be separated into an ether-insoluble fraction with a methoxyl content of 16.5%, and an ether-soluble fraction with a methoxyl content of 11.7%. Assuming a carbohydrate-lignin linkage, as pictured in example C-5, the lignin in the methylated wood would have nine methoxyl groups. On phenolysis, three phenol groups react with a lignin build-

ing unit; of these, one will replace the carbohydrate residue with formation of a phenol half acetal, and two will react in such a way that the phenolic hydroxyl groups remain free. If such were the case, the phenol lignin should have a methoxyl content of $9\times31.02\times100/910 + (3\times94) = 23.45\%$, whereas actually a methoxyl content of 16.4% is found. If, however, three methoxyl groups have been split off, the methoxyl content would be $6 \times 31.02 \times 100 / 910 + (3 \times 94) - (3 \times 14) = 16.36$, which agrees with the found value. Because fully methylated hydrochloric acid spruce lignin, when treated with phenol and hydrogen chloride, loses two methoxyl groups *(11)*, it appears improbable that three methoxyl groups are lost when lignin is extracted from methylated wood with phenol. It seems more probable that, at the most, two methoxyl groups are split off and that the lignin either was not completely methylated in the wood, or that one hydroxyl group of the lignin was covered in the wood and liberated during the isolation.

On methylation of the ether-insoluble phenol lignin with diazomethane, three new methoxyl groups are formed. On this basis, a methoxyl content of 23.45% is calculated which agrees with the value found.

The ether-soluble phenol lignin contains a larger number of phenol groups as is indicated by the high carbon content. From the methoxyl content on the basis of six methoxyl groups per lignin building unit, the entrance of seven phenol groups is calculated. On methylation with diazomethane, the methoxyl content increases from 11.7 to 23.3%, which corresponds to the formation of six new methoxyl groups, for which a methoxyl content of 32.1% is calculated. It should be remembered that, when unmethylated spruce wood is extracted with phenol and hydrogen chloride, a mixture of ether-insoluble and ether-soluble phenol lignins is obtained in 67% yield and that the ether-soluble fraction also contains a large number of phenol groups *(12)*.

When methylated sprucewood is heated with 25% of its weight of sodium hydroxide in 5% solution, it is recovered almost quantitatively. Neither the methoxyl content of the wood and its lignin content, nor the methoxyl content of the isolated hydrochloric acid lignin has changed. This result contradicts the belief that delignification of wood by the soda process is based on the opening of an oxygen ring with formation of an acid (phenolic) hydroxyl group, in this way rendering the lignin soluble, because there is no reason to believe that methylation of the hydroxyl groups prevents the opening of the oxygen ring.

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Program of TAPPI Plastics Meeting

The fall meeting of the Technical Association of the Pulp and Paper Industry, sponsored by the TAPPI Plastics Committee, will be held at the New York State College of Forestry, Syracuse, N. Y. on September 24-26, 1947. E. C. Jahn of the New York State College of Forestry is general chairman.

PROGRAM OF THURSDAY, SEPTEMBER 25TH

New Resins and Their Application to Paper.

9:30 a. m. A panel discussion led by R. A. Barkhuff.
1. Development of a Lignin for Laminated Plastics, by G. H. Tomlinson II.
2. Lignin-Filled Laminated Paper Plastics, by R. J. Seidl, Forest Products Laboratory.
3. Use of Polyester Resins with Pulp and Paper by D. G. Patterson.
4. New Synthetic Latices as a Pigment Binder in Clay-Coated Papers, by E. K. Stilbert.

2:00 p.m. Resin Analysis—T. A. Howells, Institute of Paper Chemistry, Chairman.
1. Activities of ASTM and AATCC.
2. Quantitative Determination of Resins and Volatile Contents in Resins and Impregnated Papers.
   - A. Present Practice in the Laminating Industry, by L. V. Larsen, General Electric Company.
   - B. Special Problems in the Pulp and Paper Mill.
   - C. How the Resin Manufacturer Can Help.
3. Qualitative Tests for Wet Strength in Papers.
   - A. The Need in the Paper Mill, by T. A. Howells.
   - B. The Need in the Laminating Mill, by N. Yurke, Panelyte Div. St. Regis Paper Company.
   - C. Possible Approaches to the Problem.
4. Complete Scheme of Analysis for Resin-Treated Papers and for Bulk Materials.
5. Physical and Chemical Testing of Paper Plastics Combinations and of Molded Products, by J. C. Parsell, J. P. Lewis Company.

6:30 p.m. Dinner at Hotel Syracuse.
Plastics for Paper Coating, by S. S. Gutkin, Falk & Company and G. C. Borden.
Wet Strength Resins, by K. W. Britt.

MEETING OF FRIDAY, SEPTEMBER 26TH

9:30 a.m. Fabrication and Conversion. Panel Discussion led by R. H. Mosher.
1. Pulp Molding.
2. Causes of Dimensional Instability Due to Immersion in Water, by C. J. Straka.
3. Development of Punchability and Machineability in Punching Stock.
4. Wildness, by E. G. Ham.
5. Resin Treated Papers for Plywood Overlays and for Honeycomb Core Material, by R. J. Seidl.

2:00 p.m. Problems in the Combination of Plastics with Paper or Pulp.